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DEPARTMENT OF AGRICULTURE.

MISCELLANEOUS.

SPECIAL REPORT No. 4.

THE
CLIMATE, SOIL, PHYSICAL RESOURCES,
AND
AGRICULTURAL CAPABILITIES
OF THE
STATE OF MAINE,
WITH SPECIAL REFERENCE TO THE OCCUPATION OF ITS NEW LANDS.

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MAINE: ITS AGRICULTURAL FEATURES AND CAPABILITIES.

BY SAMUEL L. BOARDMAN.

I.—SITUATION AND BOUNDARIES.

Maine is the most easterly State of the American Union, and is situated between $42^{\circ} 57'$ and $47^{\circ} 32'$ north latitude and $66^{\circ} 52'$ and $71^{\circ} 6'$ longitude west from Greenwich. It has a length of something more than 301 statute miles from Kittery Point to the outlet of Lake Pobe-nagomook, and a width of 224 statute miles at its widest part, its most westerly point being at the line of Salmon Falls River, in the town of Lebanon, N. H., and its most easterly point at West Quoddy Head. The southern boundary of the State, in its whole extent, fronts upon that portion of the Atlantic Ocean, in a succession of large bays, anciently known as the Gulf of Maine—which name has been restored and delineated upon the late maps of the United States Coast Survey. On this southern boundary there are eleven large bays, viz., York, Saco, Casco, Sagadahoc, Muscongus, Penobscot, Bluehill, Frenchman's, Narraguagus, Machias, and Long Reach. This shore line, including bays, harbors, and deep river estuaries subject to the ebb and flow of the tide, has been estimated at 2,486 miles, measured on our best maps; but the recent work of the United States Coast Survey has shown these estimates to be far below the truth, and it is believed that the actual shore line of Maine, by actual measurement, will exceed 3,000 miles. The State has by far the greatest extent of coast of any American State, Florida, the second largest in extent of coast line, having but 1,200 miles. The southern ocean line of the State is 226 miles 3,640 feet. The eastern boundary follows up the river Saint Croix from the ocean, through Passamaquoddy Bay, through the Cheputneticook and Schoodic chain of lakes to the source of the Saint Croix, thence along an ancient line due north, run in 1797, to the Saint John River, near Grand Falls, a distance of 195 miles. The northern boundary extends from the Saint John River, near Grand Falls, along that river to Crown Monument, or north-west State corner, a distance of 360 miles 3,950 feet. The western boundary extends from the monument at the point just named, over an anciently run line, to the sea, at the mouth of the Piscataqua River, near Kittery Point, a distance of 163 miles 3,760 feet. These are the boundaries of the State as defined by the treaty of Washington, August 9, 1842.

The area of the State has been variously stated by different writers, and what may have been regarded as authorities, as from 31,766 square miles* to 35,000 square miles.† But the report of the Tenth Census of the United States places it at 33,895 square miles, or a total land surface of 29,895 square miles. So it will be seen that Maine has about the same area of territory as the other New England States of New Hampshire, Vermont, Rhode Island, Connecticut, and the State of Delaware, combined. Or the three States of Rhode Island, Connecticut, and Delaware could be lost together in the forests of Northern Maine, “and still have about each a margin of wilderness sufficiently large to make its exploration without a compass a work of desperate adventure.”‡ The State is divided into sixteen counties, fourteen cities, four hundred and twelve towns, and fifty-six organized plantations.

In order that a comparison of the area of Maine with some foreign countries may be shown, the following table is presented:

	Square miles.		Square miles.
State of Maine	33,776	Saxony	5,788
England	50,922	Bavaria	29,292
Ireland	32,531	Baden	5,910
Scotland	30,463	Hanover	14,856
Denmark	14,752	Wurtemberg	7,531

Thus it will be seen that the State of Maine is larger than either Scotland, Ireland, or Bavaria; more than twice as large as Denmark or Hanover, nearly as large as Saxony, Baden, and Wurtemberg combined, and nearly as large as England.

It may appear somewhat strange that fully one-half of the territory of Maine is yet unimproved. But questions relating to boundary disputes and land titles (in the early history of the occupation of the State), speculation manias, and unwise State policy in earlier years—the consideration of which does not come within the scope of this report—retarded occupation and development for many years. And while the State has no public lands to grant for homesteads, there are yet large tracts of desirable land in Aroostook County, in the eastern counties, in the great Dead River section, and along the lines of the new railroads now being built in different parts of the State, belonging to proprietors, which are ready for sale for farms and homes, and, too, at prices which give purchasers advantages over other and, in many respects, less favored localities. These lands are described in succeeding divisions of this report.

II.—GEOLOGICAL FEATURES.

Our sources of information upon this subject are so partial and incomplete that it is more easy to define the leading outlines of the geological formations of the State than to speak of minute local charac-

* History and Description of Maine, Coolidge and Mansfield, 1860.

† Appleton's American Cyclopædia, edition 1875.

‡ Prof. Walter Wells.

teristics. The State has had at three several times partial surveys of its territory. In 1836 the legislature authorized a geological survey of the State, and the late Dr. Charles T. Jackson was placed in charge. Three annual reports, 1837, 1838, and 1839, were published. At the same time the public lands in the State belonging jointly to Maine and Massachusetts were explored by Dr. Jackson, and two reports were published (1837, 1838). In 1838, under authority of the "Board of Internal Improvements," the late Dr. Ezekiel Holmes made an exploration and survey of the territory on the Aroostook River, published in 1839 in a pamphlet of 78 pages. This report dealt largely with the agricultural features of the region explored, and among other recommendations was the growing of the sugar-beet and the establishment of a State farm. No other attempt was made by the State to obtain a knowledge of its geological and mineral resources till the year 1861, when the legislature by a resolve authorized a scientific survey of the State, with the late Dr. Ezekiel Holmes as naturalist and Prof. Charles H. Hitchcock as geologist, with a corps of four assistants. Two annual reports were published, and on account of the large demands upon the treasury of the State, in consequence of the rebellion, appropriations were withheld, and after two years' work the survey was discontinued. Much of the work of this second survey covers the same ground as did the previous work of Professor Jackson. From these incomplete reports we are obliged to gather all the accurate knowledge we possess of the geological formations of our State. What is needed more than all else is that the State shall undertake a thorough and complete survey of its whole territory, and make known to all the great and yet undeveloped natural resources contained within its borders. This will do much toward bringing our resources into economic and practical development, and it is a work the State owes to itself to have accomplished at no distant day. The State has no geological map showing its mineral resources and the characteristics of the soil. The late Mr. John A. Poor, in his memorial to the State legislature of Maine, in 1861, on "Maine as a Field for Immigration," said :

Those sheets of Greenleaf's map of Maine on which Dr. Jackson noted the result of his explorations, and which were expected to accompany his final report, were never published or returned to the State library on the abrupt termination of his labors in 1838 after he had explored a large portion of the State. Had Dr. Jackson prepared something like a general view of the geological features of the State, and their relations to those of the neighboring provinces, in the form of a geological map, the State would, we think, have continued the necessary appropriations to have completed the full survey.*

Fortunately this copy of Greenleaf's map of Maine (1832), in sections, to which Mr. Poor referred, is now in the collection of the writer. It was purchased some years since at a second-hand book store in Boston, and is justly regarded as unique. It has this legend: "Charles T. Jack-

* Maine as a Field for Immigration. Memorial of John A. Poor. Augusta: 1861, p. 51

son, Boston, Mass., 1838, Geological Survey of Maine." All the marking and colorings of the map are very plain and distinct, and it embraces the results of Dr. Jackson's two years' field-work explorations on our surface geology.

A.—TOPOGRAPHICAL OUTLINE.

The surface features of Maine may be classed in two grand slopes: 1st, the southern or Atlantic slope; 2d, the northern or Saint John slope.

(1.) *The southern slope.*—The area of the Atlantic, or southern slope, is about 24,100 square miles; its average width about 140 miles; the elevation above the sea of its northern border varying from near 2,000 feet on the west to less than 1,000 feet on the east, and its average slope per mile at least 7 feet.* This slope is favorable for the precipitation of moisture, the annual rainfall being about 44 inches. The rocks of the southern slope are mainly crystalline, or highly indurated. Although the general slope is southward or southeastward, yet a glance at a map of the State will show that all the longer streams flow eastward or westward for a considerable part of their course, these deflections being usually caused by ranges of hills running east and west. The chief mountain region crosses the State northeastwardly in a nearly straight line from the White Mountains, past Mount Abraham and Mount Katahdin to Mars Hill near the Saint John River, at the extreme eastern boundary of the State. South of this are three ranges of hills, forming the southern limits of the valleys of the Sandy, the Piscataquis, and the Mattawamkeag Rivers, and these ranges being so nearly in a straight line as to make it possible that they are really one system. Still further south is another east and west range of hills, separating the valleys of the Sebasticook and Soudabscocook from those of the coast streams, the Saint Georges, Sheepscot, Muscongus, &c. This range reaches from near the Kennebec River to the Penobscot, where it connects with a series of hills extending north and east from Rockland, and the latter may, in origin, be a part of the irregular system of hills which extend from Mount Desert northward to the lakes of the Upper Saint Croix River. This last named system Professor Stone calls the "Mount Desert Highlands." These consist in considerable part of granite, which outcrops, with some interruptions, all the way from Mount Desert to Chaleur Bay on the Gulf of Saint Lawrence. Much of this granite is coarse and easily fractured, and everywhere the line of outcrop is marked by a large number of granite boulders. Besides those named, there are numerous minor ranges, trending eastward or northeastward, as well as a considerable number of isolated hills, not, however, of great height.

(2.) *The Saint John slope.*—This slope is drained by the Saint John and its numerous tributaries, the largest of which are the Allagash,

* The Kames of Maine. By George H. Stone. [Proceedings of the Boston Society of Natural History, vol. xx (1880), p. 430.]

flowing north, and the Aroostook, flowing east. The grand divide which separates this from the southern slope is in general quite flat, and in many instances lakes and swamps near the divide have outlets both ways. Over this slope the average fall per mile toward the north and east is from 2 to 3 feet. Most of the region may be described as a great monotonous plain, abounding in swamps and varied only by a few peaks and some low rolling highlands. The area of the slope is computed at 7,400 square miles, its length 117 miles, and its breadth about 90 miles. The descent from the watershed ridge on the south to the Saint John on the north is not sufficient to give more than a slow movement to the streams, and the depression of the whole basin to the eastward is so slight that the current of the Saint John itself is moderate. The Aroostook leaves the State at an elevation of 345 feet, and the Saint John of 419 feet above the tide. The rapids and falls of the streams of this northern slope are much less numerous and less strongly marked than those of the southern or Atlantic slope. The rivers and streams of the northern slope have, therefore, less importance as furnishing power than those of the southern slope.

A remarkable feature of the surface geology of Maine is the presence of a series of systems of kames or eskers, which have been studied by Prof. George H. Stone, now of Colorado College, the results of which have been published, accompanied by a map. Professor Stone describes thirty-one different systems of these kames, varying in length from 1 to 150 miles, seventeen of which are 40 miles, or over, in length. These formations are peculiar to the State of Maine, not being found elsewhere in such marked abundance throughout the entire Atlantic slope.

The principal mountains in the State are included in a district approximately triangular in form, the vertices of which fall respectively near Fryeburg, the Bald Mountain ridge, and Mars Hill, the sides being respectively 125, 135, and 240 miles long, and the area of the whole about 6,600 square miles.* Our highest mountain, Katahdin, is 5,248 feet high, standing in the sixth rank on the scale of elevation adopted by the Coast Survey. The characteristics of the mountains of Maine are that they do not consist of ridges—the formation impressed upon the Apalachian chain in the Middle and Southern States—but of peaks, more or less conical in form, standing sometimes in isolation, sometimes in clusters, sometimes in short ranges of greater or less continuity. Their summits are generally bald rock, not immense swells of land, and about their bases they are quite invariably heavily wooded. In addition to Mount Katahdin, the chief mountains of Maine are Mount Abraham, Mount Saddleback, Mount Bigelow, Russell Mountains, and Mount Haystack. These form a group in the northwestern part of the State, in Somerset and Franklin Counties.

* The Water-power of Maine. By Walter Wells, Augusta. 1869.

B.—GEOLOGICAL FORMATIONS.

The formations in Maine are both metamorphic and fossiliferous, the former predominating. The metamorphic stratified rock occurring are, gneiss, mica schist, talcose schist, steatite and serpentine, sacchoroid limestone, clay slate, quartz rock and conglomerates, jasper, siliceous slate, hornstone. The following unstratified rocks are found in Maine: Granite, syenite, protogine, porphyry, trap or greenstone, eurite. The fossiliferous rocks of Maine are all Paleozoic, excepting certain marine alluvial deposits, and belong to the following groups: Lower Silurian, Upper Silurian, Devonian, Drift, and Alluvium. While Maine is almost exclusively a region of Azoic rocks, but to which system they belong, whether the Laurentian or the Paleozoic, has not yet been determined. The entire western portion of the State is granitic. The metamorphic rocks abound in a great variety of interesting minerals, and Paris, Oxford County, is noted for its beautiful colored tourmalines;* Parsonfield, York County, and Phippsburg, on the coast, in Lincoln County, for varieties of garnet and other rare minerals; Brunswick and Topsham for feldspar, and Bowdoinham for beryls. Along the southern portion of the State deposits of Tertiary clays are found in many localities beneath the drift. They are characterized by beds of shells of the common clam and mussel, and therefore belong to the newer Pliocene. They extend into the interior as far as Augusta and Hallowell, and are penetrated by wells sunk 50 or more feet below the surface. The metamorphic rocks along the coast near Rockland furnish the best lime in the world. Red sandstone, probably of the age of the Connecticut River sandstone, is found along the shore of the Passamaquoddy Bay, and as it is penetrated by dikes of trap, at the contact of the two rocks many interesting minerals are developed. Galena is found in veins at the contact of trap-dikes and argillaceous limestone on the shores of Cobsecook Bay. Argillaceous slates and large beds of limestone are found over the larger part of the northern portion of the State, and in Aroostook County is an extensive deposit of red hematite.

Professor Hitchcock, in closing his second report on the Geology of Maine, in 1862, wrote:

The conclusion which we have derived from a second year's exploration of the State is that when her mineral resources shall have become fully known, every one will be astonished at their immense extent and value.

From what is known of them already, the astonishment is that the State has not before this taken in hand the thorough and exhaustive exploration of her territory, for the purpose of becoming well acquainted with these extensive and valuable mineral deposits. Enough has been developed by the two partial surveys we have had to indicate our vast natural wealth in this particular; what is needed now is that we have full knowledge of the extent and value of these possessions, and ascer-

* The Tourmaline. By A. C. Hamlin, M. D. Boston, 1875.

tain to what degree it is possible to develop them for the benefit of the State.

The wealth of Maine in its granite alone is immense even at its present scale of development, and in the years to come, as it becomes still more developed, will show larger proportions. The granite exists in numerous localities, and the deposits are of great variety—gray, white, black, and red granite being found at different places in the State. The deposits now most worked are those on Hurricane Island, off Rockland Harbor; Vinal Haven, Saint George, Spruce Head, Jonesborough, and Hallowell. There are innumerable other companies in other parts of the State, but the above-named are by far the larger. The Hurricane Island works now employ three hundred men, and is furnishing stone for the court-house and post-office at Baltimore, for the approaches to the State, War, and Navy Department, Washington, monumental work for Saint Louis, Chicago, Philadelphia, and other points. About 500,000 paving-blocks are cut and shipped annually. The annual business of the company exceeds \$200,000. The Bodwel Granite Company, at their quarries at Vinal Haven, Saint George, Spruce Head, and Jonesborough, employ five hundred men, and their yearly business aggregates \$350,000, besides 1,000,000 paving-blocks. The work of this company includes the State, War, and Navy Department (now furnishing the stone for the fourth wing), custom-house, Cincinnati; numerous large, private buildings in Boston, New York, and Philadelphia; the General Wool monument at Troy, N. Y.; post-office and custom-house at Pittsburgh, Penn.; town hall, Peabody, Mass.; polished columns for the Indiana state-house; building for the Chicago Board of Trade, and large monumental works. This company's pay roll amounts to \$240,000 annually. At the celebrated white granite quarries at Hallowell, the Bodwell Company works largely on monumental work. This quarry covers about 40 acres; the granite is deposited in layers of from 6 inches to 10 feet, improving in quality as greater depths are reached. The Hallowell granite contains more feldspar than the Hurricane or Jonesborough quarries, is much lighter in color, easily polished, and peculiarly adapted to monumental purposes. The Hurricane and Jonesborough ledges closely resemble the Quincy granite, or syenite, and is of a light-gray color. Hallowell granite appears in the monumental work of nearly every State—the soldiers' monument on Boston Common, at Buffalo, N. Y., Peabody, Mass., Beverly, Mass., New Orleans, and numerous monuments in our own State; the Stephen A. Douglas monument, Chicago; Odd Fellows' monument, Boston; Pilgrims' monument, Plymouth, Mass., and numerous large individual monuments in the great cities of the United States. The annual pay-roll of this company amounts to \$125,000. These great companies are the largest ones in the State working granite quarries. At Dix Island is a large quarry from which stone was taken to construct the Treasury building at Washington, and the New York and Philadelphia post-

offices. At Clark's Island quarry, near Rockland Harbor, a large business is done in building and monumental work, and from 1872 to 1878 it furnished the stone for the city hall at Buffalo, and the post-office at Hartford, Conn. Some of the most beautiful gray granite in the market is furnished by the quarries at Thomaston and Saint George. At Frankfort are also extensive quarries of gray granite, one of the oldest quarries in the State, and from this quarry a large amount of material for the East River (New York) bridge has been obtained. About one hundred and fifty men are employed yearly. The Collins Granite Company, at Bluehill, employs about two hundred men annually. At Oak Hill, near Belfast, is a fine deposit of granite, almost identical with the celebrated Westerly (R. I.) granite. The Dodlin Hill quarry, Norridgewock, has long been famous for its beautiful granite. Black granite quarries occur in Saint George, Addison, and Columbia Falls, Washington County. A large part of the black granite used in building the rustic fence about the Capitol grounds at Washington was furnished from Columbia and Saint George. Red granites are found at Otter Creek, Mount Desert, at Jonesport (whence the stone for the fine Wellington building, Boston, was obtained), and at Red Beach, below Calais. This last-named quarry has been worked for ten years. Innumerable quarries of lesser note are found in various parts of the State, being largely operated for local needs.

A large and very valuable belt of slate of the very best quality extends through a portion of Somerset and Piscataquis Counties. In Somerset County it has been worked at but two or three points, in Madison and Cornville. The great slate formation of the State is in the southern portion of Piscataquis County, extending through the towns of Blanchard, Monson, Howard, Bowerbank, Barnard, Williamsburg, and Brownville. The largest development of the deposit is found in Brownville, where quarries were first opened as early as 1828, and worked to a limited extent. In Brownville are six different quarries, the largest of which is the Merrill quarry, which has been operated under the same management for over thirty years and now gives employment to eighty men annually, work being constantly carried on throughout the year. Slate from this quarry won the first prize at the Philadelphia Centennial Exposition for "strength, durability, and permanence of color." The product is all shipped to Boston. Until within the past few years it was necessary to transport this slate to Bangor by teams; but since the opening of railroad communication the leading quarries are now within from half a mile to a mile and a half of the station. Additional capital is needed to operate some of these quarries, and they offer good fields for investment and business. The several companies now operating the Brownville quarries work out from fifty to sixty thousand squares of slate annually.

A valuable deposit of iron ore is located in the southern part of Piscataquis County, and is known as the Katahdin Iron Works, the

first improvement of the deposit dating back to 1843. The origin of the ore is the iron pyrites of the original rock, and while its oxidation has been going on for ages, and is yet going on, experts say it is not unlimited, although it is now going on faster than is needed for smelting. The iron-works company now operating the furnaces here draw from 15 to 18 tons of ore from the furnaces daily, every day the year round, Sundays not excepted. The works use 3 tons of lime rock, obtained from the Rockland, Me., quarries daily, as a flux in the manufacture of iron. The Katahdin iron is all sent to New York, New Jersey, and Connecticut, where it is used for the manufacture of car-wheels, for which purpose it is said to be the best iron produced in any part of the world. A new line of railway has been opened to the iron works within the past year, which renders transportation easy, and greatly enhances the business of the company and the value of its works. The company own more than 30,000 acres of land, the greater part of it forest growth. They have a fine farm of 300 acres, which produced in 1882, among other crops, 100 tons of hay, 3,200 bushels of potatoes, and 3,000 bushels of oats.

There is an abundance of iron ore in Wade Plantation, Aroostook County (No. 13, fourth range), near the Aroostook River; also in Castle Hill Plantation (No. 12, fourth range), and in Perham, the township north of Wade Plantation. Iron ore is also found in other localities in Aroostook County. The ore in Wade, Castle Hill, and Perham was examined some years since by Mr. O. W. Davis, now manager of the Katahdin Iron Works Company, in connection with an iron expert from Pennsylvania, who pronounced it of excellent quality and very favorably situated for working. Large quantities of land were then bonded with reference to commencing work, but the failure of certain contemplated railroad enterprises in the county prevented the work of development. With the new impetus now being given to railroad-building in Eastern Maine, this valuable deposit is sure to be worked at no very distant day.

Limestone abounds in Maine, and is found in nearly every county. The quarries of Rockland and Thomaston are celebrated throughout the United States, and it is scarcely possible for any lime to be of better quality.* The manufacture of lime at these two points reaches the large amount of a million and a half casks annually. The attendant industries of manufacturing casks, and cutting and hauling the wood needed at the kilns, gives employment to a large force of men, and is a great aid to agriculture.

Mica is found at several points in Oxford County, and at one, Canton, a mine has been opened which furnishes blocks of fine mica 14 inches square. Capital is needed for the successful working of this mine.

In Bowdoinham, Topsham, and Brunswick are valuable and extensive deposits of feldspar. The Trenton Feldspar Company own and operate

* Scientific Survey of Maine, 1861, p. 322.

a large quarry in Topsham, where the openings are worked in on levels, having penetrated to a depth of about 50 feet. At this one quarry 6 or 7 tons of feldspar are ground daily and shipped by cars to Trenton, N. J., where it is used in the manufacture of white stoneware, which is so common and serviceable. This quarry is within 2 miles of Topsham village, where there is an abundant water-power, and a factory for the making of this ware could be most advantageously established at that place.

During the past four or five years there has existed no little speculative excitement over copper and silver mining in Maine. At one time nearly thirty different companies were organized in this State, the stock of which was upon the market. Mining exchanges were formed, mining laws enacted, a mining journal established, and much work done to bring Maine mines into notice. The chief locality of these copper and silver mines was in that peninsula extending between the waters of Penobscot and Union River Bays, and composing the towns of Penobscot, Blue Hill, Castine, Brooksville, and Sedgwick. In these towns many shafts were sunk, and many companies operated for a longer or shorter time. At present there are 13 mines in operation in these different towns, the most noted of which is that of the Douglass Copper Company, Blue Hill, now turning out an average of one ton of ingot copper daily. The shaft has reached a depth of 253 feet, and the output of copper ore is increasing in value the more it is worked. Experts believe the mine is now paying, and will continue to be worked at a profit.

Mount Mica, the celebrated locality which has furnished the beautiful red, green, light azure, and dark blue tourmalines, and which, according to Dr. Hamlin,* is "the most remarkable locality of the tourmaline in the United States, and also one of the most celebrated in the world," is in the town of Paris, Oxford County. Says Dr. Hamlin:

No other deposit in the world, yet known to the mineralogist, has yielded tourmalines of such a variety of color as Mount Mica. Some of the fragments of the broken crystals rival in beauty and limpidity, even surpassing in brilliancy, the emeralds of Peru. Others are almost equal to the purest rubellites of Liberia, which resemble the red sapphire; or they imitate with a degree of perfection the dark-green crystals of Brazil, the light-green of St. Gothard, the pink of Elba, the light-yellow of Ceylon, the blue of Sweden, and the rare white of Ariolo.

Over a hundred specimens have been yielded by Mount Mica, which would be considered as fine and remarkable as many which enrich the royal cabinets of Europe; while of the smaller tourmalines, ranging in size from one inch downward, the number is many thousands. Mount Mica is now owned by Dr. Hamlin, and is being operated with the reasonable expectation of obtaining still more rare specimens. Many localities in Oxford County abound in plumbago, which exists in great purity, and capital could be profitably employed in its working.

* The Tourmaline. By A. C. Hamlin, M. D. Boston, 1873.

In the vicinity of Perry, a coast town at the extreme eastern part of the State, there is a fine deposit of red sandstone which belongs to the highest part of the Devonian series. These deposits have been examined by Prof. J. W. Dawson, the eminent geologist of Canada, who says that proof of their Devonian age cannot be disputed.

Copper ore has been found in Lubec, near the eastern coast of Maine, of such purity that "were it on Lake Superior the veins would be taken in hand and operated at once."*

Mineral springs abound in Maine, though there are none denominated "warm." The results of the examinations by the Scientific Survey determined mineral springs of value at Bethel, New Limerick, West Newfield, Katahdin Iron Works, Fryeburg, Waterford, Lubec, Scarborough, Mount Zircon, and Poland. The Poland spring, and one recently discovered at North Auburn, are among the most celebrated. The salts of the Poland spring are principally silicates of potash and soda, and the water has given great relief in diseases of the kidneys.

In this brief outline of the geological and mineral features of Maine the aim has been to present its economic relations and their importance, leaving the more technical and scientific details entirely untouched. Our mineral wealth of granite, iron, slate, marble, mica, and lime are of inexhaustible extent and of the finest quality sufficient to employ in ordinary times an amount of capital, nearly, if not quite double that now employed in all these industries. And while Boston and New York capitalists are seeking investment all over the great West in railroads and mines, manufacturing and farming, we want to place before them the fact that here in Maine, within two or three hundred miles of the great metropolis of New England, are localities for the profitable investment of capital in our mines, quarries, undeveloped water powers, and other opportunities for business, offering as good and safe returns as can be found in any portion of the West. A more minute examination of the facts to be obtained will confirm this statement.

The following statistics from the Tenth Census of the United States show the actual business of the Maine mines and quarries for the year ending May 31, 1880 :

QUARRIES.

Whole number quarries	74
Capital invested.....	\$2,285,500
Product in census year..... cubic feet..	2,465,670
Value of same	\$1,259,086
Number of laborers employed.....	4,011
Number of laborers employed in quarrying.....	1,793
Number of laborers employed in dressing.....	2,058
Number of horses employed.....	241
Number of oxen employed.....	218

* Scientific Survey of Maine, Vol. II, 1862, p. 427.

MINES.

Gold product for year ending May 31, 1880.....	ounces..	145.1
Value.....		\$2,999
Silver for same time	ounces..	5,569
Value.....		\$7,200
Total value precious metals		\$10,199
Product per capita:		
Silver.....	mills..	11
Gold	mills..	5
Rank among States:		
In production of silver		13
In production of gold		19
Iron ore product	tons..	6,000
Value.....		\$9,000
Copper ingots.....	pounds..	102,500
Value.....		\$18,040
Minor materials	pounds..	2,000
Value.....		\$2,000
Total non-precious metals		\$29,040
Aggregate value of mining products		\$39,239

III.—CLIMATOLOGY.

The following table exhibits the mean temperature of the State for the year at places quite widely apart, the results in most cases covering a long series of years:

Table of mean annual temperatures.

Locality.	Mean temperature.	Years registered.
	°	
Fort Kent.....	37.04	4
Hancock	40.50	17
Fort Fairfield.....	38.11	—
Eastport.....	32.02	25
Steu en	42.37	13
Castine	43.40	40
Portland	43.14	10
Portland Observatory.....	42.90	31
Williamsburg	41.50	6
Brunswick.....	44.50	50
Cornish	42.85	7
Gardiner.....	43.94	66
Bath	44.50	10

The mean of the first three points, 38°.55, represents very nearly the temperature of the northern third of the State. The mean of the remaining points, 43°.21, represents, approximately, the temperature of the southern two-thirds. This makes the average temperature of the whole State 41°.65. The table given below represents the mean summer heat at points widely dispersed over the State.

Table of summer temperature.

Locality.	Latitude.	Temperature.
	° /	°
Fort Kent	47 15	61.68
Fort Fairfield	46 46	61.58
Houlton	46 7	63.33
Eastport	44 15	60.50
Castine	44 23	62.00
Williamsburg	45 21	59.10
Brunswick	45 53	59.90
Bath	43 53	64.80
Gardiner	44 10	66.80

The mean of the first three, or northern, stations being allowed to represent the temperature of one-third of the State, and the mean of the remainder to represent the temperature of two-thirds, we obtain as the average summer temperature, $62^{\circ} 43''$. Now, if we compare this temperature with the mean summer temperature of districts of country westward, in Massachusetts, New York, Wisconsin, Iowa, and Dakota, on the same degree of latitude, where records of temperature have been kept over a great number of years, we shall find that the summer heat of Maine is less than those sections mentioned by about 32 per cent. of their temperature. The annexed table exhibits the temperatures observed for the three winter months at the places named, the figures being respectively, in the larger number of instances, the mean of several or many years' record :

Table of winter temperature.

Locality.	Degrees.
Fort Kent	11.36
Fort Fairfield	14.28
Houlton	16.41
Eastport	23.90
Fort Preble (Portland Harbor)	24.70
Bath	24.00
Gardiner	19.01
Mean	19.09

Material for comparing Maine with other sections of the country in this respect is found in the records of winter temperature at points westward, situate in very nearly the same latitude :

Winter temperature of places west of Maine.

	Degrees.
Burlington, Vt.	21.60
Plattsburg, N. Y.	20.22
Ogdensburg, N. Y.	22.60
Fort Mackinac, Mich.	20.00
Saut Ste. Marie, Mich.	18.30
Marquette, Lake Superior	17.53
Green Bay, Wis.	19.92
Fort Atkinson, Iowa	20.62
Fort Snelling, Minn.	16.07
Fort Ridgely, Minn.	17.00
Fort Ripley, Minn.	10.00
Mean	18.53

The winter of Maine, therefore, is not so severe as is experienced in the corresponding latitudes in the interior. This is due to the alleviating influences of the surrounding sea, the effect of which, though it be, in this latitude, to lower the mean of the year, raises it for the winter.

In regard to the rainfall in Maine, it may be mentioned that at records kept at twenty-one different points in the State, the records extending over a series of years from two to thirty-two, the mean latitude being $44^{\circ} 27'$, the mean depth in inches is 43.24. Comparing these results with the results obtained from records kept at fifteen different points in six States west of Maine, in the same latitude, and the rainfall of Maine is about 35 per cent. in excess of those sections. The actual summer in Maine extends from May 31 to September 14, the period of general exemption from frost. Records kept at twenty-one different points in Maine show the mean rainfall for this period of summer to be 11.13 inches. The mean winter rainfall of the State at the above twenty one points is 10.13 inches. The mean depth of snow at seven different points is 83.02 inches, corresponding to 6.91 inches of water. The total downfall for the four and a half months during which the snow falls is about 15.62 inches, 6.91 of which, as just shown, come in snow. Therefore, about 44 per cent. of the total downfall during the four and a half months of actual winter is snow. The per cent. during the three months of nominal winter is, of course, greater. Rain in Maine is distributed with remarkable uniformity at different seasons of the year. Thus, the summer fall at twenty-one stations has been shown to be 11.13 inches; the winter fall at twenty-six stations, 10.13 inches. The receipt for spring and autumn are nearly equal, and are each about 10.50 inches. Of the average 42 inches of rain received yearly, 25.20 are reabsorbed by the atmosphere, and 16.20 pass off by the rivers to the sea.

Since the establishment of the State College of Agriculture and the Mechanic Arts at Orono (latitude $44^{\circ} 54' 2''$ N., longitude $68^{\circ} 40' 11''$ W., 129 feet above the level of the sea), accurate records have been kept of all the climatic conditions for a period of fourteen years. The following table, taken from the report of the college for the year 1882, shows the result of these records:

It will be readily understood that the evenness of distribution of our rainfall is a very important condition of productiveness. On the one hand we are saved from frequent and protracted droughts, such as afflict the treeless sections of the West, and on the other we are spared from the excessive and sudden rainfalls where everything is endangered by inundation. This equable rainfall is one of the great blessings we receive from our forests. Water-spouts, cyclones, whirlwinds, and "blizzards," which in their violence are so severe in many of the Western States that neither man nor beast can face them for any time and yet live, are unknown in Maine. Our trees and wooded hills are sentinels of safety, and our quiet valleys are the abodes of peace and security. The humidity of the climate of Maine is remarkable. The air, on an average, is more than three-fourths saturated with moisture. Even in the summer months the air generally contains 75 per cent. of the amount of moisture it is capable of holding at that temperature. In other words, it is devoid of dry, burning heat, in striking contrast with the scorching air of treeless sections of our country and of our densely populated cities. This is why Maine is so much sought as a summering ground for the large numbers who seek our hills, lakesides, and forests during the hot months from the large cities of Boston, New York, Philadelphia, and Washington. From the long extent of coast-line in Maine, the months of July and August give much fog along the coast counties, but in the interior, and throughout by far the larger portion of the State, the sky is usually bright and clear. In fact, brightness and sunshine characterize our climate, and the air contains an abundance of ozone.

IV.—THE RIVER AND LAKE SYSTEMS.

The river and lake systems of Maine form one of the grandest natural features of the State, and give it a prominence for its hydrographic character unequaled by any other American State. No other State in the Union has so many rivers and streams, and but two others a larger water-surface. Maine has 5,151 rivers and streams of a size sufficient to be laid down upon the State map, and 2,300 square miles of lakes and ponds. Minnesota has 3,800 square miles of water-surface, and Utah 2,700 miles, these States being the only ones having a larger area of water-surface than Maine.

The rivers of Maine are divided into two systems: first, the primary or interior rivers; and second, the secondary or seaboard rivers.

(1.) *The interior river system.*—Commencing at the western boundary of the State, the primary river systems are the Saco, the Androscoggin, the Kennebec, the Penobscot, the Saint Croix, and the Saint John, in Maine.

The Saco is, not including the minuter windings, 95 miles long. Its mean direction is southeast. The area of its basin is 1,400 square miles, 600 of which are in New Hampshire. It has four tributaries

with a united length, not including local windings, of 88 miles. The lake reservoirs of the Saco are seventy-five in number, or more than twice the number represented by the average of the same territory for any other part of the State. The yearly discharge, estimated at 40 per cent. of the annual precipitation, is, for the entire basin, 54,000,000,000 cubic feet. The power from Hiram Falls to the tide, a total fall of 343 feet, is 17,493 horse-power for eleven hours a day, or 699,720 spindles.

The Androscoggin has a length of 157 miles, its natural basin representing 3,600 square miles in Maine and 8,500 in New Hampshire. It has seven main tributaries, with a united length of 165 miles. A total of 148 lakes and ponds, grouped in four systems, furnish the reserve power of the river, representing an area of 213 square miles. The gross measurement of the Androscoggin is 85,200 horse-power, or 3,747,600 spindles. The estimated yearly discharge from the basin is 135,000,000,000 cubic feet.

The basin of the Kennebec has an area of 5,800 square miles. The length of the river, from Moosehead Lake to the ocean, is 155 miles; from the source of Moose River to the sea, 227 miles. The average width of the river at Augusta, mean of four points, is 750 feet. The descent of the river, from Moosehead Lake to the tide, is 1,023 feet, a distance of 112 miles, being a greater fall than that of any other large river in the State. The system of the Kennebec shows 311 lakes and ponds belonging to it, the entire basin of the system comprising 450 square miles. The capacity of the river is 101,000 horse-power, or 4,040,000 spindles, the annual discharge of water being 236,000,000,000 cubic feet. In the year 1866, at the time of greatest summer drought, 130,000 cubic feet per minute passed the Augusta dam.

The Penobscot basin has an area of 8,200 square miles, by far the largest river district contained wholly within the State. In length it is 300 miles; its general course east of south, and the estimated annual discharge 319,800,000,000 cubic feet. The number of lakes and ponds in the basin of the Penobscot is 467, having a total of 462 square miles of surface. Ten lakes, naturally tributary to the Allagash, have been made artificially tributary to the Penobscot, by means of canals and locks, in order that their waters might increase the volume of the Penobscot for lumbering purposes, these ten lakes having a combined surface of 42 square miles. At Bangor the volume of the river is 146,250 cubic feet per minute, or equivalent to 55,600 horse-power; 2,224,000 spindles for eleven hours per diem. On an average the river remains frozen over for one hundred and twenty-five days.

The Saint Croix basin is partly in Maine and partly in New Brunswick, and has a total area of 1,175 square miles, 375 miles of which are in New Brunswick. Its course is southeast, and its total length is 97 miles. The annual discharge of its waters is estimated at 44,800,000,000 cubic feet. Sixty-one lakes serve as reservoirs to its power, or a total surface of 150 square miles.

The Saint John in Maine has a basin of 1,400 square miles; and the river has a total length of 211 miles in Maine, its grand total length being 450 miles. Its annual discharge is 284,000,000.000 cubic feet. The general course of the river is northeast. Three main rivers constitute its tributaries, with a total length of 288 miles, having a basin representing 4,474 square miles in area. The number of lakes in the Saint John basin in Maine is 206, having a water surface of 350 square miles.

(2.) *The seaboard river system.*—The rivers named below, lying as they do between the outfalls of the interior rivers and resting upon the coast, are denominated the seaboard rivers. Being much smaller in size than the primary rivers, they are grouped in the accompanying table :

No.	Name of river.	Area of basin.	Length.	Number of spindles.
		<i>Sq. miles.</i>	<i>Miles.</i>	
1	Dennys	375	25	104, 000
2	Machias	800		
3	Narraguagus	435	50	
4	Union	750	52	224, 000
5	Saint George*	800	35	
6	Presumpscot	520	22	
7	Mousam	430	25	199, 120
8	Piscataqua	550	40	

* Including the Sheepscot, Medomac, and Damariscotta Rivers.

Upon the Saco are located the great cotton manufacturing establishments at Saco and Biddeford; upon the Androscoggin the great cotton factories at Lewiston, Auburn, Lisbon Falls, and Brunswick; upon the Kennebec the great lumber mills at Fairfield, Augusta, and Gardiner; and the cotton factories at Waterville and Augusta, with other mills at Skowhegan and Anson; upon the Penobscot the large lumber mills at Orono and Oldtown, and upon the Saint Croix the great lumber and cotton mills at Calais and Milltown. On these rivers are innumerable minor establishments, while upon the rivers of the secondary system are large numbers of all kinds of mills and factories, giving employment to large numbers of hands.

Mr. Walter Wells, in his second report on the water power of Maine—from which many of the above facts have been drawn—estimated the total number of privileges in the State at 3,100. This estimate was based upon returns from 595 municipal districts of Maine. Nearly half of the above were then (1869) estimated to be entirely unused. That there has been a great improvement and occupation of these powers within the past dozen years is very conclusive, but we have no means of knowing the exact extent of their increase, as no returns are available upon this head from any manufacturing corporation or municipal authority.

Formerly, and for many years, the owners of water-power privileges, sharing in the preposterous and ignorant hostility to manufacturing corporations, begotten and sustained by the illiberal policy of the State,

either refused to sell their property for improvement at any price, or held it at such figures as virtually put a prohibition upon all forms of enterprise. The wealthy owners of the land would not sell it; did not want to see big cities built up over their broad acres, and for years the improvement of these great powers was kept back, and the advancement of the State, in all its material interests, retarded through this spirit. Hence it was that Ticonic Falls, at Waterville, on the Kennebec, was not utilized twenty-five years ago, and all the mills on the Merrimac at Lawrence, Mass., not located in our own State. But this is now changed. Water powers are being improved; towns vote exemption from taxes for all improvements for a period of ten years, and in some cases municipalities co-operate with individuals, by subscribing in their corporate capacity to the capital stock employed in manufacturing. Still there is a great opportunity for the further development of water power in Maine, and the safe and profitable employment of capital in its development offers a good field for the investment of the capital of other States.

THE LAKE SYSTEMS OF MAINE.

Like its river systems, the lake systems of Maine are remarkable for their extent, character, and picturesqueness. Connected as they are with the river systems, they form an immense chain of reservoirs, affording storage for the vast quantities of waters needed by our rivers and streams and the grand water powers which they afford. There are, in fact, but three or four districts on the globe not more extensive than Maine, and equally habitable in other respects, upon which an equal number of lakes and ponds are to be found. No State map ever published comes anywhere near giving a correct representation of the extraordinary number of these lakes, and to get an idea of their size and numbers one must study the county maps and atlases, as well as the numerous maps in manuscript, of the timber and unincorporated lands found in the archives of lumber companies. The total of these represented upon our best maps is not less than 1,620; and this does not include the multitude of small lakes and ponds scattered about the State in such profusion that almost every neighborhood and school district has one, and not including a large number in the unexplored wild lands not laid down on any published map. These lakes possess at the lowest possible estimate a combined water surface of 3,200 square miles; so that the State has more lake surface than a million square miles of the United States situated in the central and western central districts, and south of the lake belt, not including the lagoons and bayous connected with some of the rivers, which are in fact not proper lakes. In other words, Maine has 1 lake to each 20 square miles of territory, and 1 square mile of lake to each 13.3 square miles of territorial area.

The classification of the lake systems of Maine, as defined by the late Mr. Walter Wells,* is one based upon the river systems, the lakes be-

* The Water Power of Maine. Augusta: 1868-'69. 2 vols.

ing almost universally connected with the rivers, the two forming a single organism of aqueous circulation. This is true in many cases, and needs qualification in others. With many of these lakes the connection with certain river systems is most obvious; with others they form an independent system. It is true many of the great lakes are situated at and about the head of the rivers, and that they are located either above or upon the mountain regions of the State; but it is also true that certain of our lakes, though tributary to the waters of rivers, form lake systems of their own independent of the river systems. As instances the Cobbossee-Contee Lakes, in southwestern Kennebec County, the Chamberlain, Allaguash, and Eagle Lakes, in north central Piscataquis County, and the Grand Lakes, in northern Washington County, form independent lake systems. On the other hand, Sebago Lake supplies the Presumpscot; the Rangeley and Richardson Lakes, the Androscoggin; Moosehead Lake, the Kennebec, and a vast chain of lakes in Piscataquis, Penobscot, and Washington Counties, the Penobscot. Mr. Wells's classification of the lake systems was as follows:

Systems.	Number of lakes connected with the system.	Aggregate area.
		<i>Square miles.</i>
Saco	109	84
Androscoggin	148	313
Kennebec	311	450
Penobscot	467	585
Saint Croix	61	150
Saint John	206	350
Denny's	22	38
Machias	56	68
Narraguagus	38	25
Union	43	60
Saint George	72	50
Presumpscot	45	97
Royal	6	4
Mousam	14	10
Piscataqua	22	16

This classification is one based on the river systems with which the lakes are connected as reservoirs. A more natural classification of the lake systems would be as follows:

(1) System of the Presumpscot; (2) system of the Androscoggin; (3) system of the Kennebec—the Kennebec County lakes; (4) the Moosehead system; (5) the Chesuncook system; (6) the Chamberlain Lake system; (7) the Pemadumcook system; (8) the Penobscot River system; (9) the Schoodic Lake system; (10) the Saint Croix River system. The first system in this scheme comprises the Sebago and Songo Lakes; the second, the numerous lakes tributary to the Androscoggin, chief among them being the Upper and Lower Richardson Lakes; Cup-suptic, Rangeley, Kennebago, and Oquossoc; third, the Cobbossee-Contee, Belgrade, Snow, and China Lakes; fourth, Moosehead Lake, 38 miles long and 14 miles wide, comprising 120 square miles—the largest inland lake in Maine, with Brassua, Spencer, and Indian Lakes; fifth,

Lake Chesuncook, comprising 22 square miles, and its connecting lakes, Caribou, Harrington, and Ripogenus; sixth, the grand system of lakes about the headwaters of the Allaguash River, Chamberlain Lake, comprising 20 square miles of surface, taking the lead, the others of this system being Eagle, Telos, Allaguash, Churchill, Priestly, Unesaski's, and a dozen other large-sized lakes; seventh, the Pemadumcook, Milinokett, Katahdin, Twin, and Jo-Mary Lakes; eighth, the lakes of the lower Penobscot River; ninth, the Schoodic lakes in Washington County; tenth, the great lakes supplying the waters of the Saint Croix River. The elevation of a few of the larger lakes above the sea level—confirming the statement that the chief lakes of Maine are generally situated either above or upon the mountain regions of the State—may be observed from this table:

	Feet above sea level.
Rangeley	1,513
Mooselucmagentic	1,486
Richardson	1,456
Umbagog	1,256
Long Pond	1,094
Attean	1,094
Wood	1,094
Moosehead	1,023

Twenty other large lakes are located at elevations varying from 247 to 950 feet above the level of the sea.

The scenery about these lakes is beautiful and diversified. In the older portions of the State located in fine agricultural and wooded districts, they give a charm and delight to the scenery, make the farm more attractive, and add a value to real estate. In driving through the State the traveler can go but few miles without coming to one of the hundreds of these beautiful lakes, of greater or less extent, and when on reaching some elevation two or three lakes are brought to view, with villages, farm-houses, wooded hills, far-reaching fields, orchards, and pastures, the scene is one of great beauty. And these scenes are common, giving to the State great diversity and picturesqueness. Throughout the new and wild sections of Maine, these lakes have long since been famous resorts for the sportsman and summer tourist, and the Rangeley, Jo-Mary, Grand, Moosehead, Euistis, Chesuncook, and a dozen other chains of great lakes, are celebrated in the angler's calendar as delightful, health-giving resorts that are every day becoming better known to the large class of summer visitors from the great Eastern cities.

THE ISLANDS OF THE MAINE COAST.

The long extent of Maine sea-coast, diversified as it is by numerous bays, coves, and harbors, is literally filled with islands of various extent. The report of the State land agent for 1879 gives a list of the islands sold and conveyed to different persons since the year 1786, that

formerly belonged to Massachusetts and Maine, the list comprising a total of four hundred and two, these islands ranging in size from one thousand to sixteen thousand acres. There are eight islands comprising from 1,000 to 5,000 acres: and forty-two comprising from 100 to 900 acres. A large number of these islands are settled, having fine farms upon them; others are wooded, and still others are barren. Together they form a grand natural feature of the State.

FISHERIES.

Maine ranks second only to Massachusetts in the extent and value of her sea fisheries, while her river fisheries exceed those of that State in importance. The following statistics show the business of the sea fisheries of Maine for 1880:

Persons employed.....	11,071
Capital invested.....	\$3,375,994
Value of products: general fisheries.....	\$3,576,678
Oyster fisheries.....	\$37,500
Number of vessels used.....	606
Tonnage of same.....	17,632.65
Value.....	\$633,542
Number of boats used.....	5,920
Value.....	\$245,624
Value of minor apparatus and outfits.....	\$934,593
Other capital, including shore property.....	\$1,562,235

The statistics of river fisheries are as follows:

Persons employed.....	1,591
Capital dependent.....	\$78,303
Value of product.....	\$125,046

The canning of lobsters is an industry peculiar to Maine, and twenty-three lobster-canning establishments are situated on various parts of its coast. In 1880 the total number of pounds of lobsters caught was 14,234,182 pounds, of which number 9,494,284 pounds were canned. These figures, therefore, show the business for the United States, no lobsters having been canned outside of Maine in that year. The sardine industry is also peculiar to Maine, and in 1880 it furnished employment to over 1,500 fishermen and factory hands; the capital employed was over \$400,000, and the value of the product amounted to nearly \$825,000. The menhaden fishery has in past years been an important industry. The production of oil and the manufacture of fish guano, so much so that in 1877 there were eighteen fish-oil factories on the Maine coast in the three towns of Bremen, Boothbay, and Bristol, with an invested capital of \$1,083,612; gallons of oil made, 1,166,213; tons of crude fish guano produced, 16,666; total value of products, \$633,145. From the periodic nature of the menhaden, they have not visited the Maine coast for the past three years.

Having the vast river and lake systems which it does, Maine early saw the importance of restocking its rivers and lakes with edible fish,

and was one of the first of the States to undertake this important work. In 1867 the legislature established fisheries commissioners, whose powers and functions have been continued uninterruptedly to the present day, having been enlarged from time to time as new demands have made necessary. This commission has aided, in conjunction with other States and the General Government, in restocking our rivers with sea fish, in stocking ponds and lakes with game species, in enacting laws for the protection and preservation of fish and game, in opening navigable rivers to the passage of sea fish through the building of fish-ways, and in a general conservancy of our rivers and inland waters. During the year 1882, over 1,190,000 salmon fry were placed in the waters of our seven leading rivers, while the land-locked salmon (*Salmo Gloveri*, *Salmo sebago*) was distributed to several lakes and ponds, in different parts of the State. This work has been progressing for years, lakes all over the State having been stocked with black bass, land-locked salmon, whitefish, and other species, and it is still being carried forward. An establishment for breeding Penobscot River salmon at Orland, and one at Grand Lake Stream for breeding land-locked salmon, are supported by the State and National Governments, and the best results are following the work of the commissioners.

MAINE AS A SUMMER RESORT.

More and more for the past dozen years Maine has been growing in popularity as a summer resort for the pleasure-seekers and overworked business men of our great Eastern cities—Boston, New York, Philadelphia, and Washington; becoming, in fact, from the beauty of its scenery and the delightful atmosphere of its summer climate, the great natural sanitarium for the populous cities of the Eastern and Middle States. Its extended seacoast, with numerous bays, fine beaches, picturesque islands, and quiet coves; its wonderful inland lakes, located in old portions of the State near lines of railroad, or in the great forests of the North, the paradise of anglers and sportsmen; its mountains in the midst of wild, invigorating scenery, and its delightfully located villages and clean, attractive farm houses—render it unsurpassed in attractiveness for a summering field. Take the coast line from west to east, and there are the celebrated Isles of Shoals; Wells, Saco, and Old Orchard Beaches; Cushing's and other islands in Portland Harbor; Harpswell Neck; the islands at the mouth of Kennebec River—notably, Squirrel, Mouse, and Capital; Fort Popham; Ocean Point, Boothbay; Camden and the beautiful Penobscot Bay; Northport and Belfast Bay; the old town of Castine; Mount Desert, celebrated as a watering place, and second only to Long Branch or Saratoga, with its fine mountain and inland views; Eastport, and the adjacent islands; the Grand Lakes; the city of Bangor and its great excursion tours to the coast points down the Penobscot; Mount Katahdin, just coming into prominence; the lakes in northern Penobscot; the Monson ponds; Moosehead Lake;

the Chesuncook and Chamberlain Lakes, and the neighboring waters; Lake Maranacook; the widely-known Twin Ponds; Fryeburg; Cornish; the Richardson and Rangeley Lakes; Sebago Lake and the beautiful Sango River. These places are but an outline of the circuit of the Maine summer resorts, of which there are scores of others not named, all beautiful and attractive, and all having been brought into prominence during the last few years. The season is constantly lengthening; that is to say, it is found that not only does the volume of summer travel increase from year to year, but the visitors come earlier in the season and remain much later than formerly. Public communication by rail and boat is more adequate and convenient than a few years since; good-managed hotels and boarding-houses now abound at all these points; there are thousands of summer cottages now owned by Maine residents and those from other States at our islands, beaches, and mountains, and Maine is becoming a vast summering ground. Valuable guide books to Mount Desert, Portland Harbor, the Androscoggin Lakes, Moosehead Lake, and other sections are regularly published, and give a large amount of trustworthy information concerning the natural resources of the State. Large sums of money are left in Maine by this crowd of wealthy summer visitors, and every year witnesses the inauguration of some new locality as a resort. The great diversity and beauty of scenery in Maine is the attractive natural feature. We have not a single lake, but hundreds; not one famous beach, but a dozen; not a single island, but scores and scores; not one mountain, but many—all easy of access by rail or boat (unless one wishes to penetrate the forests, lakes, and woods of our northern wilds, as hundreds are coming to do every year), and all affording beautiful scenery, quiet, good fare, a cool, invigorating summer atmosphere, and absolute freedom. The opening of these numerous summer resorts has given a great aid to agriculture. New local markets have been created for all kinds of farm and garden products—early vegetables, early lambs, early chickens, small fruits, milk—and the agriculture of whole towns has been completely transformed, improved, and put on a business system, simply through the new demands of these numerous summer resorts and “watering places.” This has had a good influence upon the general farming of whole districts, and the improvement is most seen in sections where formerly the work of improvement had not reached through other and usual agencies from other centers of influence. And a new development is to be seen in this direction in the future all over our State; new localities are to be opened, new railroads are building, new hotels and boarding houses going up—all to be a strong aid and benefit to the legitimate agriculture of the State. Moreover, the State, recognizing the value of this summer travel and residence in aiding our material development, is affording legal protection to our game, spending large sums in stocking our lakes and ponds with edible and game fish, and in other ways giving encouragement to all that can aid in making known a knowledge of the beauties of our scenery, the healthfulness of our climate, and the value of our resources.

V.—FORESTRY AND THE LUMBER INDUSTRY.

The total land surface of Maine is 29,895 square miles. There are in the State 2,420,000 acres of timber and wood land. Pine (*Pinus strobus*), and spruce (*Picea nigra*) are the species most widely distributed, and in these two varieties the greatest wealth of our forest resources has heretofore existed. Hemlock (*Tsuga canadensis*) is distributed largely over fully 2,000,000 acres, although not being the predominant species. In 1869 Prof. Walter Wells wrote:*

The primeval woods of Maine still cover an extent seven times that of the famous Black Forest of Germany at its largest expanse in modern times. The States of Rhode Island, Connecticut, and Delaware could be lost together in our northern forests and still have about each a margin of wilderness sufficiently wide to make its exploration without a compass a work of desperate adventure.

According to the census of 1880 † there were standing in Maine upon the several river systems the following quantities of merchantable pine and spruce on May 31, 1880:

River basins.	Pine.	Spruce.
	<i>Feet, board measure.</i>	<i>Feet, board measure.</i>
Saint John and its tributaries	75,000,000	1,400,000,000
Penobscot and its tributaries	100,000,000	1,600,000,000
Kennebec and its tributaries	50,000,000	1,000,000,000
Androscoggin and its tributaries	50,000,000	500,000,000
Saint Croix, Machias, Narraguagus, and Union, with other smaller streams.....	200,000,000	500,000,000
Total	475,000,000	5,000,000,000

According to the same authority there was cut during the census year ending May 31, 1880, 138,825,000 feet of pine and 301,020,000 feet of spruce. Other statistics of the lumber industry from the Report of the Tenth Census are as follows:

LUMBER SAWED.

Number of establishments	848
Capital invested	\$6,339,396
Men employed (16 years and above)	6,480
Boys under 16 years	183
Wages paid during the year	\$1,161,142

Materials.

Value of logs used	\$4,754,613
Value of mill supplies.....	197,344
Total value of all materials.....	4,951,957

* The Water-power of Maine. Second Report, p. 24.

† Forestry Bulletin, Tenth Census, No. 15.

Products.

Lumber, board measure.....	feet..	566, 656, 000
Laths		134, 820, 000
Shingles		426, 530, 000
Staves.....		62, 376, 000
Headings	sets..	3, 312, 000
Spool and bobbin stock.....	feet..	13, 426, 000
Value of all other products.....		\$182, 618
Total value of all products.....		\$7, 933, 863

In addition to the above Professor Sargent* reports 1,215,881 cords of wood consumed as fuel during the census year ending May 31, 1880, valued at \$4,078,137.

The pine has been cut from all the timber surface of the State, excepting from a quite inaccessible region about the headwaters of the Allagash River in Aroostook County.

There are fifteen large sole-leather tanneries in Maine, having a total consumption of 103,000 cords of hemlock bark per annum. In addition to the above tanneries there are in the State three large hemlock-bark extract works, consuming 24,000 cords of bark each year in the manufacture of tanning extract. The largest tannery in the world is that at Winn, in this State, which is 600 feet long, 80 feet wide, contains 700 vats, and uses 55 cords of hemlock bark daily the year round.

The amount of charcoal† used in Maine in 1880 was 500,000 bushels, all made in the State.

What may be termed the minor industries connected with or dependent upon our forests are every year assuming greater importance. The manufacture of wood-pulp, boot-shanks, spools, bobbins, lasts, shovel-handles, clothes-pins, and other minor forest manufactures are bringing into greater value our forest trees heretofore little used, as fir, poplar, white birch, beech, maple, and ash; the establishment of these industries has been the means of building up large factories, spreading out villages, giving employment to men, machinery, and transportation companies, and adding largely to the business and wealth of the State. Unfortunately there have been no available statistics of these industries to be obtained; but under a recent act of the Maine legislature these are now being compiled by the secretary of state, and will hereafter be published annually.

Ships' knees are a forest product of considerable importance. These are obtained entirely from the trees of the larch (*Larix americana*), otherwise known in this State as hackmatack and juniper. It grows on very low wet land. The chief locality for the production of ships' knees is the towns along the Piscataquis River Valley; and there were shipped over the Bangor and Piscataquis Railroad during the year 1882, 198 full cars of ships' knees, or a total of 30,000.

* Forestry Bulletin, Tenth Census, No. 23.

† Report on Forestry. Dr. F. B. Hough, Vol. III, 1882, p. 64.

Forest fires have been very destructive to the timber lands of Maine. In 1825 the great fire in this State chiefly extended from near Moosehead Lake eastward to the Penobscot River in the southern part of Piscataquis County. It has been estimated that this burnt district was some 40 miles long by 6 wide, and embraces 150,000 acres of forest growth. Since then local fires have frequently occurred, making sad havoc among the valuable timber, and entailing heavy losses upon its owners. Estimates of careful experts place this loss at from \$100,000 to \$200,000 annually. These fires occur in the summer season, from July to September, and often sweep over a large extent of territory. Strict laws are in force in this State prohibiting the setting of forest fires, and the recovery of damage therefor.

The spruce forests of Maine have, during the past three or four years, been ravaged by an insect which has been identified by Prof. Charles H. Fernald, of the Maine State College, as *Tortrix fumiferana*. Indeed, as early as 1875, the spruce timber of the Allaguash and other tributaries of the Saint John in Northern Maine—and to some extent the spruce forests of the whole of Aroostook County and the northern sections of Somerset and Franklin Counties—was much affected by this insect. It has been difficult to obtain the exact facts of the extent of this scourge. The owners of timber land have been somewhat reticent about giving information concerning it, and it may prove that the real damage is less than has been thought. The bark of the trees is perforated by small holes, and in and under the bark are found great numbers of the larvæ of the beetle. It is thought the trees are not so much injured that if cut the first year they make good timber; but if left to the second or third year the life of the wood is gone and the timber quite valueless. This is a very serious matter, and it is well that the life-history of the insect and the extent of its ravages are to be studied this season (1883) by Prof. A. S. Packard, jr., of the United States Entomological Commission. Mr. H. M. Prentiss, of Bangor, Me., a prominent lumber operator and large owner of wild land, writes:

From all I have heard the borer does not attack young or thrifty trees. The death of an old tree in decrepitude may be hastened by borers, severe drought, or other causes. Generally, where the spruce is old and about all of an age, and about ready to die of old age, the borers are said to kill as much as three-fourths of it in spots in some localities. We have seen nothing of this as yet upon the Penobscot or any of the Maine rivers, excepting the Upper Saint John. On all of these rivers the aged spruce has generally been culled out, and the forests now consist almost entirely of comparatively young and thrifty growing trees. Our Maine forests will be a forest a thousand years from now, because much of the land is worth more to raise wood on than for any other crop. We have to take good care of our forests and manage them properly, and it is our policy to cut and market all the old, decaying, decrepit trees—pine, spruce, hemlock, &c.—to save them from death by worms, rot, heavy winds, drought, and the natural death from old age. We do not, generally, have any trees cut smaller than 14 inches at the stump, nor do we generally cut in any year more than one-tenth of the wood growing on any acre of land. The reports on the general dying of timber are no doubt much exaggerated.

As valuable as are our forests, as great as is the extent of territory which they cover, and as important as are the industries founded upon them, they are not inexhaustible and must be husbanded to yield the best results. Year by year lumbermen penetrate still farther into the unexplored regions of our northern forests, and, while the statement of Prof. Walter Wells, quoted at the head of this division, possesses some of the truth to-day that it did when first printed, yet every year the forests are falling before the ax, and the trees floated to the markets are perceptibly smaller than they were fifteen and twenty years ago. In 1869 the Maine board of agriculture presented a memorial to the State legislature, praying for the inauguration of a State policy for encouraging the preservation and protection of forest trees, and for exempting from taxation any land that should be set out to forest trees or left to grow up to forest for a period of twenty years. Such a law was passed in 1872.

VI.—THE RAILROAD SYSTEM OF MAINE.

The railroads of Maine have been a very important factor in the development of business and the growth of improved agriculture in the State. From short lines, poorly managed, and connecting only the larger places, the railroads of Maine have, within a comparatively short period, become a thorough and important system of public transportation, extending to new portions of the State, opening up new localities to business, giving an enlarged demand and good market for farm products, and more than any other element contributing to the prosperity of the State.

The Maine Central is the most important line in the State. Its main line extends from Portland, via. Augusta and Lewiston, to the State line at Vanceborough, a distance of 323 miles. This line runs along the valley of the Kennebec from Richmond to Waterville, uniting the three cities of Gardiner, Hallowell, and Augusta, and extending eastward to Bangor, the great lumber port of the State, and onward to New Brunswick. Six important branch roads connect with and are operated by this company, three extending north toward the interior, and three south to important points on the seaboard. The northern branches are: 1. From Brunswick to Lewiston and Phillips, 84 miles, following the valley of the Androscoggin and Sandy Rivers for the greater portion of its distance. 2. From Waterville to Skowhegan, 18 miles, along the valley of the Kennebec. 3. From Newport to Dexter, a distance of 14 miles. The branches extending to the coast are: 1. From Brunswick to Bath, 8 miles, the last-named point being one of the most flourishing and largest ship-building cities in the country, and placing Maine second in the rank of American ship-building States. 2. From Burnham to Belfast, 33 miles. 3. From Bangor to Bucksport, 18 miles, reaching an open winter harbor to Boston boats and the shipping of

Penobscot River. The total length of the Maine Central Railway and its branches is therefore 500 miles.

In addition to its own branches the Maine Central has connections at Portland, not only with the Eastern and Boston and Maine Railroads, but the Portland and Ogdensburg, extending to the White Mountains; at Westbrook Junction, with the Portland and Rochester (running to Worcester, Massachusetts); at Yarmouth Junction, with the Grand Trunk Railway; at Oakland, with the Somerset Railroad, extending 25 miles up the Kennebec Valley into one of the richest farming sections of the State; at Oldtown, with the Bangor and Piscataquis Railroad, extending through a portion of Penobscot County and along the Piscataquis Valley to Moosehead Lake, and via Bangor and Katahdin Iron Works Railway to Katahdin Iron Works; and at Vanceborough, with the Saint John and Maine Railway for Saint John and Halifax, and with the New Brunswick and Canada Railway for Houlton, Presque Isle, and other towns in Aroostook County, for Calais, in Washington County, and for Saint Stephen, Saint Andrews, Woodstock, and all the towns in the valleys of the Saint John and Aroostook Rivers.

From the above statement it will be seen that by far the larger portion of the State and the maritime provinces are tributary to this great line. Taking into consideration the commanding position of this road, it is fortunate for the general welfare and the various interests of the State that its control is in the hands of gentlemen who fully understand and appreciate the great resources of the State, and while making every effort to extend and perfect the road, assist by every means in their power in the establishment of new industries and the development of business at all points along the line or tributary to it, and by this course secure the undivided support and interest of the public in its prosperity and success.

The secondary class of railroads in Maine, all connecting with the Maine Central, but under independent management, are as follows: Knox and Lincoln, extending from the great ship-building city of Bath, eastward along the coast to Rockland, on Penobscot Bay, a distance of 49 miles, extending through Sagadahoc, Lincoln, and Knox Counties. Aroostook River Railway, from the State line in Fort Fairfield, Aroostook County, to Presque Isle, a distance of 30 miles. This railroad, in connection with the New Brunswick Railway, is the only line of railroad connecting the beautiful territory of Aroostook County with other portions of the State and country; and the business of the road was so great during 1882, that the company found it difficult to supply the demand for cars to transport the large amount of freight offered—the product of this most fertile and best agricultural section of Maine. Bangor and Piscataquis Railroad, connecting with the European and North American division of the Maine Central at Oldtown, on the Penobscot River, and extending along the valley of the Piscataquis to Moosehead Lake, a distance of 75 miles. The Bangor and Katahdin Iron

Works Railway also connects with this road at Milo Junction, and runs to Katahdin Iron Works, a distance of 19 miles. These two lines make an important road extending into an important section of Maine, accommodating the constantly increasing volume of summer travel to Moosehead Lake, and handling the immense traffic consequent upon the iron and slate mines of Piscataquis County, and the lumber interests of this section of Maine. The Somerset Railroad connects with the Maine Central at Oakland, and extends up the beautiful valley of the Kennebec to North Anson, a distance of 25 miles. The Portland and Ogdensburg, running from Portland through the White Mountain region, operating a distance of 51 miles in this State. The Portland and Rochester, from Portland to Rochester, N. H., and so on, to Worcester, Mass., operating 49 miles in Maine. Railroad connections west of Portland are with the Eastern and Boston and Maine railroads, two great lines extending to Boston, the metropolis of New England.

Extending out from the above roads on the Maine Central, is another system of shorter lines, connecting local points and acting as feeders to the main lines. These are the Bridgeton and Saco River, Lewiston and Auburn, Norway Branch of the Grand Trunk Railway, Old Orchard Junction Railway, Rumford Falls and Buckfield, and Saint Croix and Penobscot. These are all standard-gauge roads, with one exception—the Bridgeton and Saco River Railroad, a tributary road to the Portland and Ogdensburg, which is a narrow-gauge—2 feet. The Green Mountain Railway, a new road something over 1 mile in length, is now in operation on Mount Desert. It is built on the plan of the Mount Washington Railway. Green Mountain is 1,600 feet high, and in 1882 over seven thousand persons ascended the mountain. The road is entirely for the accommodation of summer visitors to this celebrated resort.

The total number of miles of railroad now in operation in Maine is 1,066. During the year 1882 the number of passengers transported was 14,848,417; the number of tons of freight carried was 2,638,460, and the total earnings of the same were \$765,289,376.

Notwithstanding the present extensive railroad system of Maine, a system which has done so much for the establishment of business and the development of its agricultural and other resources, yet a glance at the map will show that, considering the large territorial area of the State, there are many important points not yet brought into railroad communication, and that the railroad system may be greatly extended to the still further development of our agriculture and business. And this is being done in a very quiet and progressive way. At this time work is being carried on upon at least three new lines, and the extension of others. A new railroad is being built from the Bangor and Piscataquis Railroad to Monson, opening up communication with this picturesque summer resort, and affording transportation for its quarries of fine roofing slate. Another is building, called the Maine Shore Line Railway, from Bangor to Ellsworth, Cherryfield, Eastport, and Calais, bringing

into prominence the great resources so long undeveloped of the best part of Washington County, which has much splendid farming land along its coast towns, and great lumber resources. The Somerset Railroad is pushing up the Kennebec Valley toward the grand farming section of the Dead River. The Lake Megantic Railway is practically the extension of the Intercolonial and Grand Trunk railways of Canada, and is the proposed air-line from Montreal to Saint John, New Brunswick. This road is now under contract and building from the Canada line into the State of Maine toward Moosehead Lake. It will connect with the Maine Central at Mattawamkeag, 60 miles north of Bangor, and use the roads already built from there to Saint John. This road, built with foreign capital, will open for development a large part of Northern Maine, rich in timber, mineral, and agricultural wealth. These roads are already building, and at present (1883) more railroads are under contract and building in Maine than in all New England beside. In addition to this, several new routes have existing charters or are being surveyed. One of these is from Augusta, the capital of the State, to Farmington, through a portion of the Sandy River Valley; a second is from some point on the Maine Central, near Strong, extending into the valley of the Corrobassett, and onward to the Dead River Valley and Lake Megantic; a third is from Dexter, a terminus of one branch of the Maine Central, to the Bangor and Piscataquis Railroad at Foxcroft, on the Piscataquis River, thus shortening by 70 miles the distance from Boston to Moosehead Lake; and a fourth is a new and direct line into Aroostook County, from Mattawamkeag, running up the valley of the west branch of the Penobscot, through the western portion of Aroostook County to the towns in Northern Aroostook, thus diverting the business of Northern Aroostook from provincial roads, and opening up for development an entirely new portion of the State.

Thus it will be seen that by means of our extensive and well-administered railroad system all portions of the great State of Maine are easily accessible, and brought in communication and business relation with the great railroads of the country. The business of the State is feeling the impetus imparted to it at every point, and we already see a realization of what the late Hon. John A. Poor, the father of the railroad system of Maine, pictured so graphically in his address on "The Railway," spoken at Belfast, Me., on the occasion of the opening of the Belfast and Moosehead Lake Railway, July 4, 1867.*

Eventually this line of railroad which connects the waters of this beautiful Belfast Bay in the most direct line with the largest and most beautiful of all the lakes of New England will stretch itself farther northward till it crosses the dividing ridge that separates Maine from Canada, and descends by easy gradients to the Saint Lawrence, opposite the ancient citadel of Quebec. This railroad, reaching from the seaboard to the interior, will impart new value to every farm and to every farm product within striking distance of its line. It will lift the mortgage by enhancing the value of every acre of land, of every bushel of potatoes, of every ton of hay, and of every

* The Railway. By John A. Poor. Boston, 1867, p. 21-24.

tree of the forest on its way. It will stimulate production by enlarging the market of the farmer, clear the land of its forests, which, instead of being burnt on the ground and wasted, will be brought to market and turned into gold, while the waterfalls running to waste on the route will be made great labor-doing machines, producing articles of value in various forms of manufacture and in numerous forms of industry.

* * * As you reach the lake you will connect with 36 miles of the finest inland navigation in summer, and the untouched forests around Moosehead Lake will come to market. Cultivated fields and farms will take the place of primeval woodlands. The waters of this lake will be vexed with steamers as numerous as those that now ply upon the lakes of Switzerland; and the beautiful headlands now clad in the garb of nature, hiding-places of the moose and deer, will become classic in after times, like the shores of Lake Lemman and the Lake of Geneva, the homes of scholars, poets, and historians. There is not a cord of wood on the margin of Moosehead Lake that will not be of value standing in its native forests within five years from the time the railway shall reach the lake. Gradually the railway will penetrate beyond the lake and clear the land to the very summit of the dividing ridge, giving to every tree and acre of ground a value hitherto unknown, and a population will cluster about this great lake of ours, to which other lines of railway than yours are proposed, like that which is now concentrated around the northern lakes of England and Scotland.

VII.—AROOSTOOK COUNTY.

The county of Aroostook extends across the entire northern portion of the State for 114 miles, and includes 6,800 square miles, or an area considerably larger than the State of Massachusetts. That Maine has sixteen counties, a single one of which is larger than the entire State of Massachusetts, will, no doubt, excite surprise in the minds of those not acquainted with our local geography, and give one some faint idea of the great extent of our territory as compared with some of the other New England and Eastern States. To illustrate still further: This one county of Maine is more than four times as large as Rhode Island, a third larger than Connecticut, three-fourths as large as Vermont, and four-fifths as large as New Hampshire. It is watered by the Saint John and its tributaries, the chief of which are the Aroostook, the Madawaska, and the Meduxnekeag. The general direction of all the rivers and their principal tributaries is eastward toward the Saint John, the watershed extending westward to the height of land between that river and the Penobscot and its tributaries. The surface of the county is more or less undulating, the easterly ranges of townships being less hilly and more free from stone than is usual in the State at large. The absence of bowlders is quite noticeable, and the general surface of the soil reminds one of portions of Michigan, and also of Canada West. These remarks apply to the eastern, or first, second, and third ranges of townships; the ranges west of these are more broken, sometimes hilly, with frequent bowlders, and outcrops of limestone and slate. Some townships in these eastern ranges are so free from stones that it is difficult to find enough for wells, cellars, &c. There is an abundance of iron ore in Wade Plantation (No. 13, fourth range), near the Aroostook River, also in Castle Hill Plantation (No. 12, fourth range), and in Perham, the township north of Wade Plantation. There is also iron

in other localities. These deposits were examined some years ago by A. W. Davis, esq., manager of the Katahdin Iron Works Company, in company with an expert from Pennsylvania, who pronounced it of an excellent quality and very favorably situated for working. There is limestone in Caribou and Fort Fairfield which has been worked to some extent, but has not been yet sufficiently developed to make it profitable for mechanical purposes. There is an inexhaustible formation of roofing slate in Littleton, about 8 miles from Houlton, of a very excellent quality. Sandstone of fine quality exists in Mapleton, and will no doubt be eventually worked for building purposes.

The soil consists mainly of a deep, rich, hazel loam, and is usually underlaid with a substratum of limestone, frequently with slate, the depth varying from 2 to 6 feet. The origin of the soil is from the decomposition of limestone and slate. In many places vegetable mold is found 10 feet below the surface. There is more or less of intervale bordering the streams, and a still larger extent of such as is doubtless of alluvial origin, but more elevated than that which in the older portions of the land usually is denominated intervale land. The predominating soil is what is commonly termed a "strong, hard-wood soil," and good for all crops. In the valleys between the ridges or swells of land are large extents of lowland, originally covered chiefly with cedar, which make the best grass and grain lands of the county. The soil is deep, consisting of 10 or 12 inches of vegetable matter, resting on loam or clay, and beneath this a porous subsoil.

The forest trees of Aroostook are mainly those found in other portions of Northern Maine. The white pine (*Pinus strobus*) was originally a very large, valuable, and beautiful tree of the Aroostook Valley, as well as of other portions of the county. Most of these trees were cut by the early settlers and by lumbermen many years ago, and sent down the Saint John for a market. These valuable and beautiful pines were made into hewn timber, 22 inches square, and larger, run down the Saint John to the docks of that city in rafts, where it was shipped to England, sawed into such dimensions as was wanted in their buildings, and used all over that country in the construction of the homes and houses of Old England. Next to the pine, the spruce (*Abies alba* and *A. excelsa*) were, and are now, the most valuable trees. These are found in vast numbers on all the unsettled townships, but are being constantly cut off by lumbermen. A young growth of these trees spring up very soon after the parent trees are cut, grow rapidly, and in a few years attain a sufficient maturity to render them valuable. I am informed that in twenty-four years' time spruce will attain a height of 40 feet, and a diameter of 12 to 15 inches at 2 feet above the ground. It is the principal wood used for timber and boards in building in the county, and immense quantities are every year floated down the streams and rivers to find a market. The hemlock (*Tsuga canadensis*) is not so common in the Aroostook Valley as in the southern part of the

county, where it is very abundant. Its bark is unrivaled as a tanning material, and its wood excellent for timber and other building purposes. Cedar (*Thuja occidentalis*) is very common, and attains to a large size in the primeval woods. It is being rapidly cut and made into shingles, immense quantities of which are every year sent to Providence, Boston, and other cities for a market. Mills capable of producing from 23,000 to 100,000 a day are scattered over the county and paying well. The juniper, or hackmatack, or tamarack (*Larix americana*) was a common tree formerly, and large quantities of it were cut and sent to the ship-yards of Saint John; but it has become scarce, and very little of it is now shipped, although it is still common in some localities. The yellow birch (*Betula excelsa*) is a common but very valuable tree, growing to a large size. It is used in the making of machinery, carriages, furniture, in the building of houses and mills, and in ship-building. A large amount of yellow birch has been sent down the Saint John, to the city of Saint John, from whence it has gone to England for a market. There are still large numbers of these valuable trees standing in the dense forests of the unsettled portions of Aroostook, which will, in the near future, be regarded as of almost inestimable value. The rock or sugar maple (*Acer saccharinum*) is very common in many localities, and very valuable for its wood in the making of cabinet furniture, carriages, machinery, cars, and for many other purposes. In the township of Perham, and by the French people on the Upper Saint John, the sugar maple is utilized for the making of large quantities of maple sugar. The white and brown ash (*Fraxinus americana* and *F. sambucifolia*) (?) are very common trees all over the county. The former is used largely in carriage building, and the latter, in making machinery, in house finishing, and for cabinet furniture. The basswood or linden (*Tiliaceæ*) and poplar (*Populus*) are very common, as are also the white birch (*Betula alba*), hornbeam (*Carpinus*), beech (*Fagus*), red oak (*Quercus rubra*), and fir (*Abies*). The minor trees and shrubs of the Aroostook forests are numerous and valuable for use both in manufactures and the arts. A railroad direct from the Aroostook Valley to the Penobscot Valley would reduce the expense of sending the products of the Aroostook forests, as well as fields, to a market, at least one-half, and would be of incalculable advantage to the producers as well as to the consumers of the products of the fertile fields and rich forests of this great county.

The county of Aroostook was organized in 1839, and the next year it had a population of 9,410, chiefly French with a few English trading settlements. In 1870 the population had reached 29,609, and in 1880, 41,708. From 1860 to 1880 the polls rose from 2,098 to 7,743, and the assessed valuation (about one-fifth of the real value), from \$1,105,796 to \$7,564,934. Probably no county in New England can show such advancement as this. The population at present is about 45,000.

The expense of clearing land depends very much upon circumstances.

As it is ordinarily cleared \$10 per acre is the average cost. Perhaps for cutting the trees and clearing \$12 per acre would be the average. Mr. Columbus Hayford, one of the best farmers in the county, informs me that he once offered \$10 an acre for clearing a piece of heavily timbered land, which price was declined, and he afterwards hired men by the day in a dry time and cleared it at a cost not above \$5 per acre.

Of the one hundred and seven surveyed townships, each six miles square, in the county only fifty have as yet been named. The others are owned in immense acreages by non-residents, many of whom hold more than 100,000 acres. These tracts are seldom sold, the permit to cut timber from year to year alone being rented. There are many lots of land in almost every township on which are some "improvements" or in other words more or less work has been done on them. But still they are not worth as much as they would be if the growth were standing and green. Such places may be bought for from \$400 to \$800. It is difficult to say what such land is worth, excepting to say it is worth what it will sell for; some will give more for it than others. Land of all kinds is gradually rising in value. There are many homesteads in the county worth from \$6,000 to \$15,000 each, splendid farms, with good fences, fine buildings, and near good markets.

Formerly the entire county of Aroostook was the property of Maine and Massachusetts, but for one design or another these lands have been disposed of until now there are no public lands in the county. Some of it has been sold at a mere nominal price for lumbering purposes. Some has been granted to institutions of learning, which has eventually fallen into the hands of the great "lumber kings," and in 1868 the State legislature conveyed several townships to aid in building of the European and North American Railway, with the reservation that it should be surveyed into lots suitable for farms and sold to actual settlers, when applied for, at a price not exceeding \$1 per acre. But so far I am not aware that any of the land so reserved has ever been in the market. It is true the above-named railway extends but a short distance into Aroostook County, but it is idle to say the road has not been of any advantage to the county. It connects with roads now in operation, which extend to Houlton in the southern, and to Fort Fairfield, Caribou and Presque Isle in the northeastern portions of the county, and is the main line over which the immense traffic of the county seeks a market. True, a railroad built directly to Houlton from some point nearer the Penobscot Valley, and thence through the heart of the best part of the county to Presque Isle and Caribou, would have better remunerated the State for this great extent of its domain. The 200,000 acres granted to this road should be demanded by the State for settlement. In Aroostook County are 3,000,000 acres of land in the hands of wealthy proprietors, and, while largely timber lands, many of the townships are far more valuable for settlement and farming purposes than for the value of their lumber. Moreover, there are

many farmers in the county who are the owners of several hundred acres of land, much more than they can ever clear and cultivate. These large tracts will eventually be divided up into smaller farms and sold to settlers, and already this is being done. It has been true, and is true today, that a farmer of small means can go into Aroostook County and buy out claims at better advantage than they can take up a new lot and begin a farm.

As a sample of the prosperity of Aroostook County let us take a glance at the present town of Presque Isle, located in the heart of the county at the terminus of the New Brunswick and Maine Railway. In 1860 this town had a population (or rather the two towns of Maysville and Presque Isle, now united as one town) of 1,388 persons, and a valuation of \$137,860. In 1880 the town had a population of 5,445 and a valuation of \$554,603, and both population and valuation have largely increased in the past three years, the increase being fully or more than 3,000. There are but thirty towns in Maine having a larger population than Presque Isle, and three of these are in Aroostook County. That portion of Presque Isle, formerly the town of Maysville, is universally regarded by those well acquainted with the agriculture of the State as the best tract of land, 6 miles square, to be found in Maine. Every rod is good land; there is not an acre of waste land in the township. The town had no mills, no merchants; all its inhabitants were farmers; and yet in 1880 it had a valuation of \$224,325.

The climate of Aroostook County is exceedingly healthy. The region adjacent to Fort Kent is probably one of the healthiest within the United States. This is at the extreme northern part of the State, at the junction of Fish River with the Saint John, in latitude $47^{\circ} 15'$ N. and longitude $68^{\circ} 38'$ W., in a direct line, 60 miles from the Saint Lawrence and 180 from the sea. At Fort Fairfield the climate, though somewhat rigorous, is uniform for long periods and uncommonly salubrious. The growing season is somewhat shorter than in the more central and southern portions of the State, but the rapidity of growth when once begun is unparalleled in other parts of New England. The snow falls early, and generally before the ground is at all frozen. It remains, steadily and uniformly covering the ground, until spring opens, a warm blanket two to four feet deep, with no alternations of freezing and thawing. When it goes off the transition from winter to summer is almost instantaneous, and the soil may be worked at once. Being thus kept warm and from freezing through the winter, the soil, as before mentioned, being deep and porous, the superfluous moisture readily passes downward; no time is lost either for the ground to thaw or to become sufficiently dry and warm to be worked to advantage. The crops are put in with no delay, and, once in, they proceed with rapid strides to maturity. Notwithstanding the comparatively short period of growth of crops, the term during which cattle require to be fed from winter stores of forage is much shorter than would at first appear, from the reason that the autumn

feed in the fresh pastures is abundant and good until snow falls, and as soon as it disappears, in spring, stock find plenty of fresh, green, and nutritious grasses. In this particular Aroostook County certainly possesses decided advantages over central and southern Maine, and generally over most agricultural sections of New England.

Another noticeable peculiarity of the climate of Aroostook County is its exemption from injurious droughts. Whether, and to what extent, this exemption may be due to the presence of the large amount of forest growth, and whether the same exemption from drought may be expected to continue after the county becomes more opened up and the "high-woods" laid low, are matters of some uncertainty; but the probability that they are closely connected, the one with the other, adds force to the well-known and abundant argument against indiscriminate waste and havoc of the forests, and in favor of retaining, now that it may be done in so many instances where towns and farms are yet to be made, sufficient wood for fuel, timber, and especially for shelter to the new homes, fields, orchards, cattle, and crops. The matter of *shelter*, especially, is an important one, and I cannot forbear to express the hope that it may be duly considered and acted upon.

The agricultural productions of the county of Aroostook are hay, oats, wheat, buckwheat, potatoes, hops, cattle, horses, and sheep, and dairy productions. As a grazing and hay-producing section, Aroostook County cannot be excelled by any part of New England. Indeed, as a grazing and dairying section the county is one of rare excellence. Oats, wheat, and buckwheat are leading crops. Hops are grown to a considerable extent. Indian corn has not been a leading crop, but its culture is extending. It was formerly thought that apple trees could not be successfully grown in the county, but this is being slowly disproved, and orchards of many valuable kinds of fruit are extending all over the settled parts of the county. In dairying the county is fast coming into prominence, and at Houlton is located one of the most successful cheese factories in the State, one already noted in the Boston market for the great excellence of its product. The farm stock has been improved by the introduction of thoroughbred Short-horns and high-grade Herefords; the class of horses raised is a most valuable one for general uses, and the sheep of Aroostook County have long been called the best that go into Boston market.

The manufacture of potato starch is a great industry in Aroostook County. The first starch factories were built in 1875—one at Presque Isle and one at Caribou. There are now twenty-eight starch factories in the county, one or two of which have two sets of machinery. The cost of a factory with a daily capacity of from 4 to 6 tons of starch is from \$5,000 to \$6,000. The average capacity of the twenty-eight factories in Aroostook County is about 75,000 bushels of potatoes worked up during the usual working season of each year, which is from about the middle of September to the middle of November. Upon an average

200 bushels of potatoes make a ton of starch, which is 5 tons of starch to each 1,000 bushels of potatoes, 375 tons of starch to each factory, or 10,500 tons in all. In 1882, a single factory at Caribou converted 98,000 bushels of potatoes into 392 tons of starch. The price paid for shipping potatoes the fall of 1883 was 95 cents to \$1.05 per barrel. The potato product of Aroostook County in 1879 was 2,248,894 bushels. At present all potatoes shipped to market from the county are shipped in the Eastman heated cars, about fifty of these cars having been employed for this purpose in 1882. By this means of shipment the potatoes go free from injury by freezing, and a uniform supply and steady price are thus secured for them in the Boston market.

One of the most important enterprises ever inaugurated for the benefit of the agriculture of Aroostook County is the immense slaughtering establishment at Houlton of Messrs. Swift & Maxfield. Heretofore a large business has been done by persons in buying up sheep and lambs and shipping them alive to Boston; but the fame of Aroostook mutton in that market, and the shrinkage that ensued from shipping alive, caused the above firm to take possession of that market as they have done of the beef market of Chicago. Ice-houses were filled in 1882-'83, a slaughter-house of large capacity erected the summer of 1883, and fifteen refrigerator cars built expressly for this business. The fall of 1883 this business was put in operation, and six hundred sheep and lambs are being daily dressed for the Boston market. After being kept thirty-six hours in ice-closets they are forwarded by refrigerator cars to their destination. Forty-five thousand sheep and lambs will thus be slaughtered the fall of 1883, and later in the season fat wethers will be slaughtered for the export trade. Preparations have also been made so that beef can be dressed here, as well as mutton, and forwarded to the same market. In connection with this system of sending dead meat from Aroostook to Boston, all the waste products are wrought to utility. The tallow is extracted by boiling the refuse portions of the animals, and the hides are salted and shipped to Bangor firms by whom the wool is pulled and the hides dressed. It is estimated that the sales of cattle alone in this county for the year 1883 will approximate \$300,000, the most of which are driven from the county on the foot, or shipped by rail. But the new abattoir at Houlton promises to revolutionize all this, and is by far the most important enterprise for the development of the live stock and farming interests of the county that has yet been put in operation in the State.

Bee culture is one of the most important of the minor farm industries of Aroostook County, and is more largely engaged in here than in any other part of New England. There are many apiarists who keep from 75 to 150 colonies of bees, and who market from 1 to 3 tons of honey annually. There are between 30 and 40 hop-farms in the county, the yield averaging half a ton per acre. In 1872 the price per pound for this product was 75 cents; in 1883, 24 cents.

In 1870 a colony of 50 Swedes settled in the township of New Sweden, under special aid and encouragement from the State. The colony has proved successful, and in the first two years of their settlement increased the 125 acres of land cleared by the State to 2,200 acres. Roads have been made, houses, barns, a church, a public hall, and school-houses built, the colony spread out into the adjoining townships of Woodland, Perham, and Caribou, and now numbering about 1,500 souls. An addition to the colony from Sweden is expected in the fall of 1883.

In the table below I give the statistics of seven farms from the towns of Presque Isle, Caribou, Fort Fairfield, and Easton, which may be regarded as an average representation of a very large number of the farms in Aroostock County. These are statistics of actual settlers, and I give their names in each instance.

Name.	Acres in grass.	Acres plowed.	Hay.	Potatoes.	Wheat.	Oats.	Buckwheat.	Rye.	Cheese.	Butter.	Value of all crops.	Paid out for labor.
			Tons.	Bush.	Bush.	Bush.	Bush.	Bush.	Lbs.	Lbs.		
F. Hayden	75	50	75	2,700	87	1,756	.....	.....	2,657	1,000	\$2,874	\$500
Sol. Jones	50	35	80	2,200	130	400	325	.....	.....	.....	2,051	300
Jas. Doyle	200	95	200	4,000	300	1,500	800	200	.....	.....	5,600	1,200
Jacob Hodsdon ...	40	10	70	2,000	.....	.....	.....	.....	Value.	Value.	800	50
John Eddy	45	10	30	848	25	300	.....	.....	\$125	\$140	800	100
William Hunton...	35	30	55	800	50	400	150	.....	.....	.....	1,000	200
A. Whitcomb	65	30	40	2,300	60	300	.....	.....	.....	.....	1,560	40

It will be seen that the 7 farms reported have 505 acres in grass, 260 acres in cultivation, cut 550 tons of hay, raised 14,848 bushels of potatoes, 652 bushels of wheat, 4,656 bushels of oats, 1,275 bushels of buckwheat, and 200 bushels of rye. The total value of these crops at their market price at home (with some minor products not named) is \$14,685, paying out for hired labor \$2,390, leaving \$12,295 for the owners of the 7 farms, averaging \$1,756.43 to each owner. The statistics given are for the year 1882. From these and similar statistics it would seem that, in a county where wheat can be raised for 50 cents per bushel, oats for 20 cents, and crops of hay which cost only a single day's work per ton to harvest it, and while all these crops can be raised in unlimited quantities and sold in the home markets, wheat at \$1.50 per bushel, oats at 45 cents, potatoes at 80 cents per bushel, and hay at \$10 per ton, the farmer must be very unwise not to make himself a rich man, comparatively, in a short period of years, by legitimate farming.

It is not easy to predict what the future of this grand agricultural section of Maine will be. A prediction such as will no doubt be realized in the very near future would be regarded as extravagant by most minds. The county embraces one hundred and eighty townships, and its area is more than a fifth of that of the whole State. Its population

was, in 1830, 3,399; in 1840, 9,413; in 1850, 12,527; in 1860, 22,479; in 1870, 29,609; and in 1880, 41,700. Its valuation increased from \$1,105,696 in 1860, to \$7,564,932 in 1880. Its population nearly doubled and its wealth increased almost seven-fold in twenty years. Four of these twenty years were years of war, to which Aroostook sent thousands of soldiers, not a third of whom ever returned. And those who have studied the increase of population in the county since 1880, noted the increase of wealth, of farms in number, size, and value, of new buildings, houses, and mills, of new industries, of shops and stores, of trade and means of transportation, know that the growth of this county, truly the "Garden of Maine," if not of New England, is without a parallel in the history of the State.

VIII.—THE EASTERN COUNTIES.

The eastern counties in Maine—Washington and Hancock—both have a large extent of sea-coast, and of timber and unimproved lands. Washington County has an area of 2,700 square miles, and Hancock an area of 1,632. Situated east of the Penobscot River and south of Aroostook County, they form the extreme southeastern portion of the State, and make a somewhat distinct agricultural and business community. Washington County may be said to be in general a strong clay loam, the surface generally level, or in gradual swells or ridges which nowhere attain very great height. The county of Hancock, on the contrary, is rough and broken, and near the coast picturesque and mountainous.

Washington County has a coast line of 180 miles, abounding in bays and coves which afford excellent harbors. Its six chief rivers are the Saint Croix, Denny's, Machias, Pleasant, and Narraguagus. They are connected with lakes which afford ample storage capacity, forming abundant water-power.

The water-powers of these rivers are alone capable of driving all the machinery now in motion in Maine, and yet they are largely unemployed. On their banks, in the interior, are almost unlimited forests of young timber, birch, poplar, spruce—now so largely used in the making of pulp, hoe and broom handles, packing-boxes of various kinds, barrels, casks, and a dozen other different articles that may be termed the minor lumber industries. Along the shore line, extending from the western limit of the county round to Calais on the east, is an extensive tract of fine agricultural land; the soil a most excellent one for grazing sheep and stock husbandry, dairying, and the growing of the small cereals, although not so good for corn or orcharding. The facilities for obtaining marine manures like fish-waste, rock-weed, kelp, eel-grass, musclemud, and similar marine manures is most excellent, and they are largely used by the farmers. Along the rivers are rich bottom lands and extensive diked marshes which produce very heavy crops of most kinds of grains and roots grown on Maine farms. The annual timber product

of the chief rivers in the county are given as follows: Saint Croix, \$4,000,000; Denny's, \$1,000,000; Machias, \$2,500,000; Pleasant, \$1,000,000; Narraguagus, \$2,000,000; or a total yearly business of more than \$10,000,000. Washington County produces 80,000 tons of hay, worth \$800,000; and with better market facilities could easily be increased to a production of 150,000 tons, which would be worth \$1,200,000. Washington County yields some of the best potatoes grown in Maine, and if a market could be obtained, her virgin lands would grow potatoes in great abundance unsurpassed by even the rich lands of Aroostook. There are several establishments in the county for packing wild fruits, such as blueberries, raspberries, and cranberries, and their business already exceeds \$90,000 in value, yearly. The egg product of the county is now in excess of \$50,000 a year; and when the first steamboat line was established between Portland and the towns along the coast eastward to Machias, in 1865, not a single dozen of eggs was shipped from Machias River. The frozen-fish business of the four towns of Eastport, Machias, Addison, and Millbridge is now of sufficient volume to load two cars a day during the three winter months. Valuable deposits of red and black granite are now worked at Red Beach, Addison, and Jonesborough, and already the business at these quarries amounts to \$200,000 annually. These facts are given in brief to show what the present business of the county is, and what excellent opportunities for larger development and increase of business is possible when the new railroad now building shall extend to the leading points in the county. Practically, the county of Washington—with the exception of a single point near its northern limit—is shut out from the advantages of rail communication with the rest of the State and the great markets of the country. But with a new line now built to Ellsworth, and prospectively to Sullivan, Machias, and Calais, this new shore line will open up a vast extent of territory, develop water-power, advance manufactures of many kinds, and greatly aid agriculture by creating a new and ready market for all productions of the farm.

THE DIKED MARSHES OF MACHIAS RIVER.

Along the Machias and East Machias Rivers are extensive tracts of salt marsh lands, the chief portion of which has been diked for the purpose of keeping out the sea, and for the growing of a better quality of grass than on land exposed to the action of the sea. One of these diked marshes is on the east side of Machias River, half a mile below the village of Machias, and has been diked nearly fifty years. The dike was built by throwing up the marsh earth along the banks of the river, and it is generally 8 feet thick at the bottom and 6 feet high. At some points, however, as where the dike crosses the mouths of the creeks, or extends over a long extent of low land, it is 30 feet across at the base and 15 feet high. In consequence of the soft character of the marsh soil it quite frequently gets broken away by the overflow of

high tides, and in many places it has been found necessary to protect the dike by a heavy planking on the sea side. Before this marsh was diked the sea flowed in over its full extent, and the grass growing upon it was a coarse and quite worthless water grass of little economic value. The grass now growing upon it is a mixture of herdsgrass, clover, red or brown top, and fowl meadow. The clover grows fine and thick and forms a thick bottom; the herdsgrass grows very heavy, and the whole is cut with a machine. If left to stand too late the timothy is liable to rust.

Upon a small river known as Middle River, emptying into Machias River near Machias village, is a marsh of some 400 acres, which was diked some fifteen or eighteen years ago at a cost of about \$20,000. The dike was built across the mouth of the river, some 80 rods in length. This dike was not built from the low soil (or rather from the marsh soil), as in case of the one just described, but the earth for this dike was taken from the upland near by, making a much firmer and more substantial dike. The result of this dike was that the land on the upper portion of the river bottom, back from the dike, was quite readily improved, and produced a better quantity and quality of grass; that nearer the mouth of the river did not so readily yield to the work of improvement. There the better kinds of grass for years steadily refused to grow, and only the coarser kinds of water-grasses held a lodgment, while for many years large spots were quite bare of vegetation. It was thought the presence of so much salt in the soil was the reason the cultivated grasses did not at first succeed. But it is said the first marsh reclaimed was a long time coming fully under improvement, and for many years after the dike was first constructed the English grasses persistently refused to become attached firmly to the new soil. So far as I am aware, these are the only instances of the reclaiming of large tracts of salt marsh land in our State.

Hancock County is very irregular in outline, having a coast indented by many harbors and bays, and the land surface is uneven. Indeed, the coast of this county is said to be "thicker set with first-class bays, harbors, and islands than any other seaboard of equal length on the Atlantic coast." There are about three hundred islands within the county's seaboard limits, two hundred and seventy of which are sufficiently large to be noted on the county map. Six towns are islands, six are peninsulas, and twenty-two are washed by salt water. The largest island within the county is the largest and most conspicuous of any upon the whole Atlantic coast—Mount Desert—famous as a summer resort and watering place. The county has celebrated deposits of copper and lead ores, which have been operated to a large extent. Immense ranges of both white and red granite traverse the county, and being within easy reach of water communication, are being quarried to such an extent as to render them important business interests of the county. The fisheries of the county, together with ship-building, give employ-

ment to large numbers of men, while in the interior towns lumbering is one of the leading business pursuits. The wild land area of Hancock County is 530,499 acres. Of the area which is unimproved one-half of it may be regarded as profitable for pasturage only—grazing ground for a million sheep—and the half remaining would make 4,892 farms of 70 acres each.

Few counties in Maine are better adapted to sheep husbandry than Hancock. About three-fifths of its land area is not well adapted for tillage land, in consequence of its rough surface; but it is well adapted for sheep-walks. In 1870 the county had 20,000 sheep, and in 1880 it had 23,525. Mr. Samuel Wasson, a most intelligent agricultural writer, in speaking of this subject in 1878, said:

Hundreds of our waste acres—39 acres to one sheep—are standing upon the assessor's books at a value of but 70 cents an acre, which as sheep pastures would pay an interest of from \$3 to \$7 per acre, provided we were rid of our twenty-four hundred dogs.*

Dogs are the great hindrance to the extension of profitable sheep husbandry in most parts of Maine.

Statistics show that in 1875 dealers in only three towns in the county received 78,380 dozens of eggs. In the same proportion for other towns, the egg production for the county would be 640,000 dozens annually.

Cranberries are receiving considerable attention from the farmers in Hancock County, which has thousands and thousands of acres of low, wet, swampy land worthless for cultivation, which might be made productive and remunerative if given up to cranberry culture. The towns of Surry, Lamoine, Hancock, Franklin, and Eden are quite prominently devoted to the growing of this crop. It is an industry which offers a good opening for its more extensive prosecution in this county.

SEA-ISLAND SHEEP HUSBANDRY.

Along the Maine coast are many islands which are well adapted to the grazing or keeping of sheep throughout the year, with no shelter but such as is afforded by the low evergreens growing upon the islands, and without feeding them during the winter from stored forage. Of the instances of successful sea-island sheep-farming in Maine I note the following:

Mr. Gilbert Longfellow, of Machias, owns an island of 1,400 acres, situated in Englishman's Bay, south of the town of Jonesborough. This island has upon it several hundred acres of the very best tillage land and about 200 acres of grass pasture. Half of this island is heavily wooded with spruce, fir, birch, maple, &c. The island is open on the east to the full ocean, which rolls in thousands of cords of sea-weed. The seasons are much milder than on the mainland. Upon this island Mr. Longfellow has a flock of some two hundred and seventy-five sheep,

* Agriculture of Maine, 1878, Second Part, page 236.

a mixed class of sheep having some of the characteristics of the South-down and Merino, with some of the coarse-wooled breeds. These sheep run on the island summer and winter, being divided into flocks of about twenty-five to thirty each, and are kept in an inclosure where they can get to the shore for sea-weed, and into the woods for shelter. Their living in winter is chiefly some of the varieties of sea-weed, principally what is called *dulse*. They also eat the branches of nearly all the trees that grow on the island. In regard to other details of winter-keeping on the island Mr. Longfellow writes:

The sheep like fir better than spruce, are very fond of mountain ash, eating branches as large as one's finger. The bark of the elder is also a favorite food, and raspberry, also the moss from old stumps and logs. I had a flock in my field one winter; the snow came deep in March, and I used to carry out hay to them, about 50 pounds daily to fifty sheep. After a while they would come up near the barn for it. Sometimes some of the sheep from the other parts of the island would come up where they were eating, but would only take a few mouthfuls and then leave it. I have several times taken tugs to the barn that were poor and weak, but they almost always die. It seems to be hard for them to get through the first winter; after that they are all right. The wethers keep fat all winter. Some losses occur from the sheep getting washed off the rocks by the approaching tide, but such losses are not so common as one would suppose. My sheep commence lambing in March, and get through by the first of May. I find these early lambs are hardier than late ones. They will stand a snow-storm better than a cold rain, and by coming early the lambs are better able to stand the winter, and the ewes wean the lambs time enough to get recruited before cold weather. Few sheep are lost by disease. The mutton of these island sheep is very superior. It has none of the mutton taste so many dislike, but resembles venison.

Mr. Longfellow may be called a veteran in the business, the details of his sheep-farming having been given to the public first in the bulletin of the National Association of Wool Manufacturers, as early as 1874 (Vol. V, p. 187).

A more recent contribution to this same subject is found in the experience of Mr. John P. Wentworth, of East Knox. This gentleman purchased, in July, 1882, an island known as Dyer's Island, which comprises some 900 acres, and is a part of the town of Harrington, Washington County. It is located one and a fourth miles from the steamboat wharf in Millbridge. A large portion of this island is covered with a forest of mixed growth of birch and fir. When the purchase of this island was made, Mr. Wentworth also purchased all the sheep upon the island, some two hundred in number, all raised on the island; indeed, sheep have been kept on this island for a period of fifteen years, without any artificial food or protection, grazing in the fine pasture in summer, and in winter subsisting on the kelp and sea-moss, found in great abundance on the shores, which is very nutritious, and of which the sheep are very fond. In April, previous to purchasing the island in June, Mr. Wentworth made a careful inspection of the sheep upon it, and found them in much better condition than his own flock at home, which had been cared for and fed with early-cut hay, and the wethers were then good mutton. On visiting the island

in January the sheep were also in good condition. It is Mr. Wentworth's plan to improve the flock by the use of fine wool rams; and of the success of his enterprise there can be no question. In one particular the advantages of this system of sheep husbandry is apparent—in the absence of loss and injury from dogs, which, in the older counties of the State, is one of the great hindrances to profitable sheep husbandry. Another consideration is in the fine quality of the mutton, which, devoid of the strong flavor sometimes present in mutton, always commands a high price in market when its fine character is known. With the hundreds of islands on the Maine coast, favorably situated for this business, sea-island sheep farming is likely to assume great importance in the future agricultural economy of the State.

IX.—THE NORTHERN COUNTIES.

Having spoken of Aroostook County—which is our most extreme northern county—in a previous division, I now wish to say something of the northern sections of Franklin, Somerset, and Piscataquis Counties, which, with a part of Aroostook, comprise a very large portion of Maine, now new and thinly settled, but which within the next twenty years is to become developed and occupied to an extent now little thought of.

The entire area of Franklin County—at the northwestern part of the State—is 1,600 square miles, the northern boundary of which extends to the Canada line. The Saddleback and Mount Abraham range of mountains, continuing eastward on a line with the Rangeley Lakes, which are located in the northwestern part of Franklin County, divide the county in two nearly equal portions, separating the Sandy River Valley on the south from that of the Dead River on the north. From the line of highlands that marks the boundary between it and Canada flow down the headwaters of the Androscoggin and Kennebec Rivers. Mount Abraham has an elevation of 3,387 feet, and Saddleback Mountain of 4,000 feet. These two mountains mark the middle portion of the county, while Mount Blue, with an elevation of 4,000 feet, and its range of attendant hills to the eastward, subdivides the southern section of the county. The region of the Rangeley Lakes and the mountains just mentioned, is one of great attractiveness as a summer resort, and is probably visited by more persons during the year than any other part of Maine, excepting Mount Desert. In the valley of Sandy River, within a radius of 10 miles from the beautiful village of Farmington, is to be found more variety of scenery, perhaps, than in a section of like extent anywhere in Maine. There are the bold features of mountain ranges to the northward; the pastoral beauty of the wide, rich, fair valley, warm and fertile; the wealth of forest and orchard, and the productive intervals and numerous rounded swells of high, productive soil, which make up a picture of beauty and grandeur not often found in Maine, in such wide variety, within so small a section.

The region in view from the Saddleback Range is not less striking; for on the west and southwest are the Rangeley and Richardson Lakes, partly in Franklin and partly in Oxford Counties, while to the northward is the Dead River Valley, a large tributary of the Kennebec flowing through a rich section of timber and farming lands. In the vicinity of the lakes, and in the northern part of Franklin County, are several townships of valuable timber-land with settlements already made. In 1859 a railroad was opened to Farmington, the county seat of Franklin County, and in 1880 rail communication was extended to Phillips, a distance of 18 miles northwest of Farmington—a narrow-gauge road. This is sure to be pushed on to the Rangeley Lakes within a few years, opening up a large and valuable agricultural section. In this part of Maine is found one of the best evidences of prosperity and independence by purely agricultural enterprises to be found anywhere in New England. Previous to the opening of the railroad to Farmington, this community, comprising seventeen towns, had for nearly a century supported in affluence an average population of 20,000 people, without any aid from commerce, manufacturing, and but little from the lumbering interests, and in a region away from the great markets. Grazing—the growing of cattle and sheep—was the line of farming chiefly followed, and giving attention to this brought success and independence. In the towns of Central and Northern Franklin are good openings for farming, dairying, stock-growing, sheep-husbandry, and orcharding. Land is reasonable and farms with some improvements made upon them can be purchased at good rates. The enlarged railroad facilities give good markets for all farm products, and these facilities are being extended into new sections of the county, for at this writing surveys are being made for a railroad from Farmington through the northeastern towns in Franklin County, reaching out toward the Dead River Valley.

The county of Somerset is 200 miles in extreme length, and 42 miles at its greatest width, comprising twenty-eight towns, four organized plantations, and sixty-eight townships of wild lands. Moosehead Lake, 40 miles long, lies midway of its length on the eastern line, and gives rise to the Kennebec River, the second longest river in Maine, which for nearly half its course runs through the center of the county. Between Moosehead Lake and the western line of the State is a chain of lakes extending across the county and discharging into Moosehead Lake. The rivers Saint John and Penobscot both have their source in the northern part of Somerset County. At the forks, so called, the Dead River, or eastern branch, unites with the west branch or main river. In the valley of the Dead River are some of the best intervale or bottom lands to be found in the State—fine, deep, and rich. Here are large farms where great quantities of hay and grain are produced for the use of the lumbering teams in winter. On these river bottoms the bones of moose have been found at a depth of 10 feet from the surface. The soil is fine, of remarkable fertility, and yields great crops of wheat and

oats. Of course the great wealth of this part of Somerset County is in its extensive forests of valuable timber. The river bottoms make excellent farming lands; back from the river are good ridges of mixed hard-wood growth, but there are immense sections only valuable for the growth of timber. The price of townships varies from \$5,000 or \$10,000 to \$80,000 each, according to the amount of stumpage and the facilities for getting logs to market. This section, the lake and forest regions of Northern Somerset, is a famous resort for anglers and sportsmen, and every year the numbers who visit it increase steadily. Much of it is rough, wild, and mountainous; but as the lumber becomes cut off, agricultural operations succeed, and invariably with good returns. Two-thirds of the area of Somerset County are yet covered with a dense forest into which inroads are being made each year, but this is not to last always. The Somerset Railroad already extends into the county as far as North Anson, and is now being surveyed for an extension to New Portland, Lexington, and the northern heart of the county. It is sure to be built at no distant day, and when built will probably form a link in a great through-rail line between Quebec and the Kennebec River, long in agitation. There is good agricultural land enough in Northern Somerset for a new county, with thousands of farms where as fine crops and as good stock can be grown as in any part of New England.

Piscataquis County contains more than one hundred townships, with a total area of 3,780 square miles. Its location is in the north-central portion of the State. It is 100 miles in greatest length and about 50 in greatest width. The chief river in the county is the Piscataquis, which gives the county its name, but there are numerous smaller rivers and streams and an abundance of lakes in the county, so that the water-power is abundant and sure. Iron-ore, slate, granite, and limestone abound, as has been shown in a previous chapter. The highest mountain in Maine is located in this county, Mount Katahdin, which reaches an elevation of 5,248 feet. The entire county of Piscataquis constitutes a large part of the most elevated portion of Maine, lying on an average more than 1,200 feet above the level of the sea. The greatest height of land appears to be about midway between Moosehead Lake on the west, and Pemadumcook on the east, Chesancook on the north, and Sebec Lake on the south, and also in the region of Mount Katahdin and that portion of the county to the northwest. From this high land streams flow off in all directions, and between them runs the west branch of the Penobscot. Here is the great lake region of Maine, and Mr. Varney, author of a history of the State, says: "There is not known to me any other tract of equal extent with this in the world, having so many lakes and ponds." Nearly two-thirds of the townships of the county are now covered with forests, and wholly unoccupied, excepting by the lumbermen in their annual operations for timber. Along the valley of the Piscataquis are some of the best farming towns in Maine; and through this valley runs the Bangor and Piscataquis Railroad to Moosehead

Lake, which has given a wonderful impetus and development to farming, manufacturing, and industrial pursuits all along its entire course.

These brief notes give some idea of the great extent, the immense resources, and the opportunities for business which exist in what are termed the northern counties, or northern portions of the central counties of Maine. It would be easy to fill page after page of this report with accounts of large and splendid farms carved out of the forests, or taken up on these river lands, or along some of our many lakes, in a few years time, comparatively, but the object has been more to present general and accurate outlines, leaving the details to be sought out by those who have interest in the subject. Farms with good buildings, fences, and improvements are always to be purchased, as from one cause or another changes in families are constantly occurring, and such farms are in the market at fair rates. In healthy localities, near good villages, churches, schools, with good markets, I believe they offer as good inducements for happy homes, for competency, for comfort, as can be found in any State of our Union, or in any part of our broad country. Aroostook County, and the portions of the northern and eastern counties just described, are just now in their embryo or formation period as regards the building of railroads, and the development of their great natural advantages and resources. Opportunities for the employment of capital and enterprise in different lines of manufacturing, in milling, in lumbering, in farming, in all the elements that make a State strong, abound here, and they are worth looking over by men of wealth before locating in other States. And not only do these counties offer good openings for business enterprises of different kinds, but for the young farmer of moderate means who wishes to make for himself and family a home having all the comforts and enjoyments which an old country can offer over one that is new, and where the comforts and advantages of society are not found, these new lands in some of the old counties of Maine afford an opening unsurpassed by that of any other State in the Union.

X.—THE GENERAL AGRICULTURE OF THE STATE.

For more than half a century the agricultural methods of the State of Maine have been guided by the best intelligence and skill of the period. For nearly a century—the first agricultural society in the State was established in 1787—the good influences of organized effort toward improving agriculture have constantly been felt, while for more than fifty years that best of agencies for advancement, the agricultural press, has been a medium of information and power for good. Consequently, what has been the best in method and practice has not been slow of adoption by our farmers; and there has been a constant spirit of advancement, progress, and improvement. The following notes embrace a few historical references, and are designed to show the present condition of practices of field, crop, dairy, and live-stock management in the State.

THE CEREALS.

Indian corn is one of the great staple crops produced, although in recent years its culture has given way considerably to sweet corn grown for packing. There are in Maine about seventy corn-canning factories. These have an acreage of from 40 to 400 acres of sweet corn each; and the total pack of corn for 1883 was above 10,000,000 cases. This corn has a very high reputation in the market, and is shipped all over the world. In no case is the corn grown by the operators of the factories. It is grown by the farmers on a contract and delivered by them to the factories at a given price per can, the amount paid in 1883 being 3 cents per can of 26 ounces. An average crop per acre is one that will yield 1,500 cans, but there are numerous instances where 2,000 and even 3,000 cans have been obtained. Exceptionally heavy yields, reported in 1882, are one acre of 3,300 cans, one acre of 3,332 cans, and three acres yielding 8,899 cans. The average price paid for an acre of corn is \$50, but it is not an uncommon thing for \$80, \$100, \$105, and \$125 to be paid for the produce of an acre, respectively. The fodder, or stover, is to be reckoned an important part of the return from the crop. It is becoming quite a practice for the stover, and the husks, and waste of factories, to be ensilaged in silos. Numerous instances are recorded where this has been pitted and fed out with the best results. Yellow corn, grown under good culture, yields from 35 to 60 bushels of shelled corn to the acre. In many cases premium crops have reached 80 and 100 bushels of shelled corn, respectively, per acre. Corn is not much grown on sward or broke-up land, as it is termed, on account of injury from the wire-worm, but is usually grown on land that has previously been in potatoes one year. This gives a finer tilth to the seed-bed, and with good manuring gives a heavy yield.

Wheat is quite universally grown, Maine producing more than all the other New England States put together. In 1879 Maine produced 665,714 bushels, while the other New England States produced 561,323 bushels. Twenty-five to forty years ago the growing of wheat had almost gone out of practice on Maine farms, on account of the ravages of the wheat midge or fly (generally, but incorrectly, called "weevil"), which was probably the *Cecidomyia tritica*, Kirby, of naturalists. For years no wheat was sown. But gradually a revival in the interest of wheat-growing commenced some years ago, and under the stimulation of liberal prizes from the agricultural societies and the generous crops that rewarded good culture, the growing of wheat again became general, and is now one of our surest crops. Early sowing is indispensable, and is believed to be one great element in a successful crop. By early sowing I mean just as early as it can be got into the ground. From the 25th of April to the 10th of May—certainly not later than that—is the best time. In order to be sure of a good seed-bed for wheat, it is a good plan to fully prepare land on which wheat is to be sown in the fall, so

that it will be in readiness to sow as soon as the snow disappears. Very frequently farmers sow wheat when, in order to harrow it in, the soil harrows up muddy instead of light, and frost is not yet all out of the soil. Wheat generally follows corn, and is almost invariably used to seed down to grass with. Our best crops go up to 30 and 35 bushels per acre; the average is 14 bushels. The variety chiefly grown is the Lost Nation, a sort sent out some years since by the Department of Agriculture. From the report of the Oxford County Agricultural Society I give a summary of four prize crops grown by farmers in that county, with the yield, cost, and profit:

Name.	Amount of land.	Cost.	Yield.	Profit.
			<i>Bushels.</i>	
F. Porter.....	1 acre, 15 rods.	\$43 50	31½	\$39 07
J. B. Porter.....	1 acre.	24 45	22	33 55
H. P. Hammond.....	1 acre, 36 rods.	56 75	38½	32 00
C. Fuller.....	1 acre.	17 50	21½	26 12

Oats, barley, rye, and buckwheat are staple crops. Barley is not so largely grown as formerly, and the other grains are more largely grown on new lands in Aroostook and the northern and eastern counties than in the older portions of the State. In 1879 Maine produced 2,265,575 bushels of oats, 242,185 bushels of barley, 26,398 bushels of rye, and 382,701 bushels of buckwheat.

MEADOWS AND PASTURES.

Hay is the most important crop grown in the State, and in 1879 the yield was 1,107,788 tons, worth more than \$15,000,000. Compared with the other New England States the yield is as follows:

	Tons.
Maine.....	1,107,778
New Hampshire.....	583,069
Vermont.....	1,051,183
Massachusetts.....	684,679
Rhode Island.....	79,328
Connecticut.....	557,860

In seeding down to grass, wheat is the crop preferred, and barley next. Oats have been disliked on account of shading the ground too closely, and therefore smothering out the young grass plants. But where land is rich it is coming to be regarded a good crop with which to seed. Fall seeding is but little practiced—I mean seeding in September with winter grain; but there is a plan of reseeding and manuring grass fields which is gaining in practice among our best farmers. It is seeding in the fall after the ground has become frozen, with 6 to 8 pounds of timothy and 3 pounds of alsike clover, on the grass stubble; then spreading upon it from 3 to 5 cords of farm-yard dressing, made fine, per acre. This keeps the field constantly reseeded and refertilized, and this plan does not need to be applied to the same field oftener

than once in four years, and the fields are thus kept in good heart and in condition to give a good yield. This plan presents a remedy for old bound-out mowing fields, and for the frequent taking up of fields that need some system of renovation, but which cannot be sufficiently manured if taken up and planted, then sown, before being laid down. Our best grass lands are found along the borders of brooks and streams, originally covered with a growth of alders and ash. They afford a strong, vigorous soil, do not readily "bind-out," are but little affected by drought, are eminently adapted to grass production, and in that capacity are not easily exhausted.

The pastures of Maine are generally high, sweet, productive, well watered, and in most cases supplied with abundant shade. That they are in many instances grown over with ferns, spireas, and other worthless weeds, is too true. One of the pressing problems which crowds itself upon the farmer's attention, is how to restore, renovate, or improve these old pastures. It is one, however, which is being resolutely taken in hand by many farmers with the best results. But all pastures do not require the same treatment. Plowing and reseedling, top-dressing, underdraining, cutting the ferns and bushes, surface scarifying and reseedling, burning, are among the plans that have been and are being tried with good results. Pastures must come to be regarded as though they were a part of the mowing fields, and liable to be mowed, then the large acreage required to support a grazing animal will be reduced, and the question of less acres to go over to obtain a given yield, and better farming in every department, will have been settled.

ORCHARDING, TRUCK FARMING, AND SMALL FRUITS.

In the value of its orchard products, Maine leads the New England States, and stands the thirteenth in rank among the States of the Union. Compared with the other New England States in this particular, the figures are as follows:

Maine	\$1, 112, 026
New Hampshire.....	972, 291
Vermont.....	640, 942
Massachusetts	1, 005, 303
Rhode Island	58, 751
Connecticut	456, 246

Maine is pre-eminently an apple-growing and apple-producing State. The soil, climate, and other natural conditions are just suited to the healthy and vigorous growth of the trees and the perfecting of the fruit. It has long been known that our Northern grown fruits are among the best keeping and finest flavored apples in the world, and will command the highest price wherever apples can be carried, and, with cargoes of ice, they have been safely carried to the farthest points of the globe. The greater firmness of flesh which Maine grown apples possess, and

their consequent high and rich flavor, give them a great superiority for shipment over those grown in the Middle States. Apples sent from Portland to Cuba in slow sailing vessels have arrived in much better condition than those sent from New York by steamers, and our Maine apples can be sent after more Southern grown fruit has gone out of the market. Already there has a large trade sprung up in Glasgow and Liverpool for Maine apples, which are shipped from Portland. A line of English steamers leaves this port weekly, during the winter season, for Liverpool, and with almost every trip Maine apples are sent out, arriving in splendid condition and bringing a high price. Formerly but little attention was given, comparatively, to varieties; but in recent years large orchards have been set out of the best winter sorts, which are now bearing large crops and giving good returns. The leading varieties of winter or shipping fruit are Baldwin, Greening, Northern Spy, Bellflowers, Roxbury Russets, and Talman Sweets. Systematic, careful, judicious orcharding as a business is now being carried on largely by our farmers, who make a study of this branch of farming and are meeting good success. We have many orchards in the best fruit-growing sections—Kennebec, Franklin, Androscoggin, Somerset, and portions of Oxford and Penobscot Counties—that number from 1,000 to 3,000 trees. Apple trees do not succeed along the coast towns so well as in the central portions of the State; and in the high latitudes fruit culture is not much attempted, as in the northern part of Aroostook County. Pears, grapes, plums, and peaches are grown generally throughout the central and southern portions of Maine. One grower in York County raises 300 or 400 bushels of peaches annually, of good quality.

With the development of our water-powers and the erection of the manufacturing cities in our State, a new market has been made for the products of the truck farm, and market gardening is becoming a leading specialty in the vicinity of all our large cities. Until within a few years our markets were supplied from Boston markets, but now growers in our own State are making truck farming a leading business. Portland, Lewiston, Auburn, Gardner, Bath, Rockland, Augusta, Waterville, Bangor, and hundreds of smaller villages now form good markets for early garden crops, lettuce, cabbages, celery, strawberries, potatoes, onions, and all varieties of "truck," and there are already celebrated farms devoted to this class of crops. Not unfrequently three or four acres of strawberries are grown by one person. There is a good market for these crops and there are many good openings for the business of growing them near our large and enterprising towns, cities, and villages. This line of farming is comparatively new in Maine, but is already one of our most successful lines of business farming.

There are good markets for everything grown and raised upon the farm at the very doors of the farmer in every part of Maine, and at the best prices.

STOCK HUSBANDRY.

What was then called "thoroughbred stock" was brought to Maine as early as 1827, the thoroughbred bull Denton, a "Durham Shorthorn," having been introduced into Kennebec County at that date. The Herefords followed soon after, then the Devons, and then the Jerseys. At present we have few Devons, but have many fine herds of Shorthorns and some of the best herds of Jerseys, Herefords, Polled Angus, and Sussex cattle on the continent. Perhaps there is more interest in the Jerseys in this State at present than in any other breed. There are ten or a dozen splendid herds of American Cattle Club Jerseys in the State, while of the Maine Jersey Cattle Association registry, this society having published three volumes of its Herd Book, there are equally as many. Within the past few years six hundred head of thoroughbred English Herefords have been imported directly by Maine breeders, a goodly number of which have gone West, while about one hundred Polled Angus and a choice herd of Suffolks have also been imported directly to Kennebec County, the heart of the best farming section of the State, if we except Aroostock County. The cross-bred and grade cattle of the State, as working oxen, milch cows, and young stock, are of good quality and show great improvement over the cattle of twenty years ago. In 1882 Maine sent 9,396 head of cattle to the Boston market, but it is safe to say the numbers sent in 1883 will reach nearer 13,000. The value of the farm stock in Maine returned by the census of 1880 was \$16,499,376.

Sheep husbandry receives great attention at the hands of Maine farmers, particularly the improved American Merinos. In Somerset County, the census of 1880 returned 116,910 sheep, nearly double the number of any other county in the State. The sheep of this county are almost wholly Merinos and their grades, and Anson, in Somerset County, is the headquarters of the Maine Merino Sheep Breeders' Association, which has established a registry of the thoroughbred, selected sheep of the State. But there are thoroughbreds of Southdowns, Oxford Downs, Hampshire Downs, Shropshires, and Cotswolds in the State in large numbers, so that cross breeds are widely introduced. Of the 655,500 sheep demanded to supply Boston market yearly, Maine sent in 1882 36,656; but now that facilities exist at Houlton, in Aroostock County, for slaughtering sheep at that point and sending them to market dressed in refrigerator cars, the number forwarded will be very much greater in 1883, and will continue to grow larger year by year in the future. In all probability the slaughtering of beef cattle for Boston market will also form a leading business of the live-stock industry of Maine in the years to come. We have unsurpassed facilities for it, and the opportunities only need to be mentioned to soon be taken advantage of by business men.

In the production of fine carriage, road, gentlemen's driving, and business horses, Maine has a reputation second only to that of one other State

in the Union. Famous sires have given Maine great fame as a horse-rearing State, and we have breeders all over the State who are carrying on the business with the outlay of great skill, ability, and money; and building upon a good foundation a solid structure of high credit, superior characteristics, and staying qualities for Maine horses. In the value of horses, working oxen, and sheep, Maine leads the New England States.

State.	Horses.	Cows.	Working oxen.	Sheep.
Maine	87, 848	150, 845	43, 049	568, 918
New Hampshire	46, 773	90, 546	29, 152	211, 825
Vermont	75, 215	217, 033	18, 868	439, 870
Massachusetts	59, 629	150, 435	14, 571	67, 979
Rhode Island	9, 661	21, 460	3, 523	17, 211
Connecticut	44, 940	116, 319	28, 418	59, 431

DAIRY FARMING.

The first cheese factory was established in Maine, Franklin County, in 1871, and the interest in this industry was very great for several years immediately following. They continued to multiply, reaching the highest number in 1875, when sixty-three factories were reported as in operation. The average number of cows furnishing milk in that year to a factory was ninety-four. In 1882 but twenty-four factories were reported in operation. The chief cause of the closing up of so many of the factories was the want of cows. No factory can be profitably operated and give satisfaction on the milk of from sixty to one hundred cows. And notwithstanding our great advantages as a dairy State, the interest in associated dairying has been declining for the past five or six years, but there is now beginning to be a revival of it in another form—that of the creamery or butter factory, and there is every indication that it will spread and succeed. Already four or five butter factories are in successful operation, and the indications are that others will be ready to start with the opening of the season of 1884. But while the interest in associated cheese making has somewhat declined, that in private butter dairying has rapidly increased. Our fine herds of Jerseys afford the foundation for superior private dairies, and Maine butter finds a ready market, not only in the large cities of our own State, but in Boston, the cities and towns of Massachusetts, and even Philadelphia. Physically, Maine is admirably located for a dairy State. We have superior grazing lands, pastures well watered by pure brooks and springs, and a climate which during the grazing season is most favorable for the handling of milk and the manufacture of dairy products. Moreover, we are near the great consuming and shipping markets of the Atlantic seaboard. We have as fine herds of dairy cows as can be found in the country. In the future, Maine must take high rank as a dairy State. The following are the comparative statistics of

dairy products in the New England States by the census of 1880, by which it will be seen that Maine has the second rank:

States.	Butter.	Cheese.
	<i>Pounds.</i>	<i>Pounds.</i>
Maine.....	14, 103, 966	1, 167, 730
New Hampshire	7, 247, 272	807, 076
Vermont.....	25, 240, 826	1, 545, 789
Massachusetts.....	9, 655, 587	829, 528
Rhode Island	1, 007, 103	67, 171
Connecticut.....	8, 198, 995	826, 195

The farm buildings of Maine are ample, commodious, often elegant. Barns and stables upon farms, with hardly an exception, are well built, warm, generally clapboarded or shingled, very commonly with cellars underneath them, and frequently supplied with running water. Improved implements, in large variety, are found on most farms. In 1879 the farmers of Maine paid \$212,135 for purchased commercial fertilizers, according to the census returns. I think the figures too low by more than one-half. Farms are well fenced, although in late years roadside fences against fields are being discontinued in many towns—a plan that cannot be too highly commended.

As agencies for the promotion of agricultural advancement the State has four agricultural papers; a State college of agriculture and the mechanic arts; a State Agricultural Society, holding fairs at Lewiston; an Eastern State Agricultural Association, holding fairs at Bangor; a State Board of Agriculture, holding farmers' institutes in each county in the State annually; a State Jersey Breeders' Association; a Maine Merino Sheep Breeders' Association; a State Pomological Society, holding exhibitions and meetings, and publishing an annual report; thirty-eight county and local agricultural and horticultural societies; a State Grange of Patrons of Husbandry, and subordinate granges, having a membership of over thirteen thousand members; two State and several county bee-keepers' associations; one State and several local poultry-breeders' associations; numerous horse-breeders' or racing associations, and about sixty farmers' clubs, holding annual exhibitions, and during the winter months regular meetings for discussions. The State Board of Agriculture has published thirty volumes of reports, comprising a body of information on the agriculture of the State in its various branches which has been of incalculable worth to the farmers of Maine, and a great aid to the development and elevation of our farmers and farming.

CONCLUSION.

Maine is a healthy State. We have no malaria; the natural drainage is excellent; building locations are unsurpassed for beauty and healthfulness; water is pure; there are no stagnant pools or marshes to breed disease. The older portions of the State are well timbered, and in the newer portions standing groves can be left where desired.

Society is good. Education is fostered and promoted by the State, and in almost every town the church and the free high school stand side by side. Public libraries and reading clubs abound; intelligence is universal. The most rugged of our mountain districts, by means of its water power and its mineral and agricultural wealth, is capable of sustaining a more dense population than the richest agricultural sections of the West. The bracing climate, pure water, and the stimulating influence of the wild, natural scenery of our mountains, lakes, rivers, and forests, are worth more for the development of art and industry, and the consequent production of wealth, than the spontaneous abundance of the richest cotton or rice fields of warmer States.

Within the limits of Maine are to be found not only all the attractions of natural scenery, but as many of the sources of wealth combined, physical, agricultural, and mineral, as can be found in any portion of the United States. With our extended and deeply indented sea-coast on the line of favoring winds; with our mountainous regions that distil in profusion the clear waters that swell our rivers and fill our lakes, descending from high elevations by circuitous courses, in a succession of cascades, to the ocean; our abundant forests, rich in their wealth of valuable woods, so useful to the arts; our productive soil, giving nourishment to all the crops of the most favored north temperate zone, and our extensive and diversified system of manufactures, mining, and ship-building, Maine, in the full development of her resources, has the power to become a mighty nation, and almost defy the competition of the world. In one great natural feature—our water power—Maine surpasses any section of the globe of equal extent. Our annual supply of moisture, the great agent in accomplishing the beneficent operations of nature, is uniform beyond example. Rain falls with extraordinary regularity in the interior, from the elevation of its mountain summits, within the reach of the atmosphere of the sea. Cyclones and destructive tornadoes are almost unknown. Our crops have great immunity from destructive pests, and economy and industry are surely and uniformly rewarded.

We have a vast country, and the West and the East alike have their part to play in its full development and means of prosperity. Comparisons may not be allowable, but if we carefully study the Boston market reports from week to week and year to year, and follow up the quotations on any line of farm products, it will not be found that in any one is there a depression on account of what is termed "Western competition." The conclusion is unavoidable that, as the western communities grow independent and are accumulating money from their lands, we in Maine can equal them in quality and comparative profit for all lines of production suited to our climate.

